VITAMIN ASSESSMENT 2025

MOBILIZING FORTIFICANT SUPPLIERS

TO DRIVE NUTRITION IMPACT

ATNi
NUTRITION MARKETS IMPACT

ABOUT ATNi

ATNi (Access to Nutrition initiative) is a global foundation headquartered in the Netherlands that actively challenges the food industry, investors, and policymakers to shape healthier food systems. Its mission is to transform markets so that, by 2030, at least half of companies' food and beverage sales are derived from healthy products. ATNi analyzes and translates data into actionable insights, driving financing, partnerships and innovations for market transformation so that all people have access to nutritious and sustainable food. ATNi is overseen by an independent unpaid board and is funded, among others, by the Gates Foundation and the UK Foreign, Commonwealth and Development Office. More information about ATNi's governance and operating policies is available online.

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DISCLAIMER

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ACRONYMS AND ABBREVIATIONS

ATNi	Access to Nutrition initiative
B2B	Business-to-business
DALY	Disability-adjusted life year
FAO	Food and Agriculture Organization of the United Nations
F&B	Food and Beverage
GAIN	Global Alliance for Improved Nutrition
GPF	GAIN Premix Facility
ILO	International Labour Organization
KPIs	Key Performance Indicators
LMICs	Lower- and middle-income countries
LSFF	Large-scale food fortification
M4N	Millers for Nutrition
N4G	Nutrition for Growth
NCD	Non-communicable disease
NIFTEM	National Institute of Food Technology and Entrepreneurship
NPM	Nutrient profile model
OECD	Organisation for Economic Co-operation and Development
PAHO	Pan American Health Organization (regional agency of WHO)
SDG	Sustainable Development Goal
UNICEF	United Nations Children's Fund
WNA	Workforce Nutrition Alliance
WFP	World Food Programme
WHO	World Health Organization

GLOSSARY

Consumer	End-user who eats or drinks the final product (e.g. fortified food).
Customer	Entity (e.g. food and beverage company, miller, humanitarian organization, or government agency) that purchases ingredients (e.g. fortificants) from a producer or supplier for further processing or programmatic use.
Fortificant	Refers to both single micronutrient compounds and vitamin and mineral premix blends used to fortify foods and beverages.
Fortificant distributor	Entity that transports and delivers fortificants from producers to customers, typically handling logistics, storage, and supply chain management, without manufacturing the products.
Fortificant producer	Refers to both manufacturers of single micronutrients and companies that formulate premix blends. Mi-cronutrient manufacturers may supply their products directly for fortification or sell them to companies that combine multiple micronutrients into a premix blend, which is also in turn used for fortification. Some companies produce both single micronutrients and premix blends.
Fortificant supplier	Entity that sells or provides fortificants to customers—either fortificants it manufactures itself or fortificants sourced from other producers.
Large-scale food fortification	A nutrition-specific intervention, regulated by government, that deliberately adds one or more essential micronutrients (fortificants) to a staple food or condiment for the purpose of correcting or preventing micronutrient deficiencies in populations at increased risk.
Market-driven fortification	Fortification that is optional and motivated by market demand, but within government-set regulatory limits, where food manufacturers voluntarily add specific micronutrients (such as vitamins and minerals) to food products for commercial reasons.
Premix	Premixes are commercially-prepared, customized blends of vitamins and/or minerals in which each nu-trient component is pre-scaled and precision blended into a form that is then added to food vehicles.

EXECUTIVE SUMMARY

CONTEXT

Micronutrient deficiencies—often referred to as hidden hunger—affect more than five billion people globally, contributing to poor health, impaired cognitive development, and reduced economic productivity.[1] Women and children in low- and middle-income countries (LMICs) are particularly at risk, with one in two pre-school-aged children and two in three women of reproductive age worldwide having at least one micronutrient deficiency.[2] Large-scale food fortification (LSFF)—the addition of vitamins and minerals (fortificants) to widely consumed staple foods and condiments—is a proven, cost-effective strategy to address these deficiencies, delivering high returns on investment, with every USD 1 generating up to USD 27 in economic gains.[3,4] Compared to other interventions, fortification offers a lower cost per disability-adjusted life year (DALY) saved and contributes directly to multiple Sustainable Development Goals (SDGs), including SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-being).[5,6]

Fortification has expanded significantly, particularly in LMICs, with 143 countries having fortification standards for at least one food vehicle.[7] However, many fortified foods still fail to meet national micronutrient standards, limiting their potential public health impact.[8] These gaps are largely driven by low compliance, resulting from persistent challenges faced by industry and regulatory actors. These include limited resources for monitoring fortification quality and practices, unclear guidance and standards, and limited technical capacity for effective fortification, especially among small- and medium-sized producers.[8-10]

Fortificant producers have a critical opportunity to strengthen the fortification value chain. Beyond supplying high-quality ingredients, it is essential that fortificants are tailored to the intended food vehicle and comply with national regulations and dietary guidelines. Global producers also have the opportunity to prioritize supplying regions with high rates of micronutrient deficiencies and ensure that their products are affordable and accessible. With significant financial and technical resources, these suppliers are also well positioned to support their customers through technical assistance, including training and the provision of equipment. However, their role as part of the business-to-business (B2B) sector, remains largely unexamined in nutrition accountability frameworks. For the private sector to meaningfully advance the nutrition agenda, consensus is needed on the expected and potential performance of fortificant producers, as well as greater transparency on their current practices.

PURPOSE AND SCOPE

To support efforts to improve fortification outcomes, ATNi (Access to Nutrition initiative), with support from the Gates Foundation, developed the **VitaMin Premix Supplier Assessment 2025.** This is the first independent assessment of fortificant producers on their policies and practices to support effective fortification and improve nutrition outcomes. The VitaMin Assessment evaluates **11 of the world's largest producers of micronutrients and premix blends.** Together, these companies supply the majority of fortificants used in LSFF globally, including vitamin A, iron, folic acid and zinc. All 11 producers have at least one facility approved by the Global Alliance for Improved Nutrition (GAIN) Premix Facility (GPF), which certifies fortificant suppliers against stringent quality criteria.

The VitaMin Assessment complements GPF's evaluations of fortificant quality by assessing producers' broader responsibilities in advancing fortification efforts and improving nutrition outcomes. The VitaMin assessment includes:

- **Corporate Profile assessment** of fortificant producers' global policies and practices, evaluated across 11 indicators categorized under four thematic areas: Commercial Nutrition Strategy, Engagement with Customers and Distributors,

Nutrition-Sensitive Activities, and Workforce Nutrition. Companies were assessed based on publicly available information and voluntary disclosures.

- **Country case studies** in India and Kenya provide practical insights into the role of fortificant producers in strengthening the fortification value chain. Findings are drawn from interviews with a range of stakeholders, including fortificant suppliers (n=15), food producers (n=7), an industry association (n=1), a laboratory (n=1), development partners (n=11), and representatives from government and research institutes (n=5).

Together, these components provide a comprehensive review of how fortificant producers contribute to improved nutrition outcomes—highlighting positive practices that other companies can emulate, as well as opportunities to elevate the role of these B2B actors within the broader nutrition and food systems transformation agenda.

KEY FINDINGS

Corporate Profile

As shown in Figure 1, company engagement and disclosure varied among the companies assessed, with only three companies providing detailed, evidence-backed input, while others contributed minimally or did not respond to the assessment. Disclosure was inconsistent across categories. While some information on commercial nutrition strategy was publicly available, it was generally less detailed and provided less insights compared to the information on customer engagement, which was typically shared confidentially.

The key findings are outlined below, with company result cards available online.

Commercial Nutrition Strategy: Of the 11 companies, two suppliers—dsm-firmenich and Hexagon—have integrated nutrition into their core business strategies with measurable goals. Six others acknowledge their role in addressing public health challenges, but their implementation mechanisms remain unclear. All companies could strengthen documentation and disclosure.

Engagement with Customers and Distributors: Seven of the 11 companies provide some form of technical assistance to customers—such as customization, innovation, capacity building, testing, and instructions on the appropriate handling, storage, and use of the supplied fortificants. However, none demonstrated a structured framework with measurable objectives to guide this support and ensure high quality end-product outcomes.

Four companies—BASF, dsm-firmenich, Hexagon, and Zhejiang NHU—extend handling and storage guidelines to distributors, though these are not explicitly linked to formal agreements and do not reference recognized guidelines. Two other companies—Mirpain Supplevit and Sudeep—mentioned related procedures but did not provide supporting evidence.

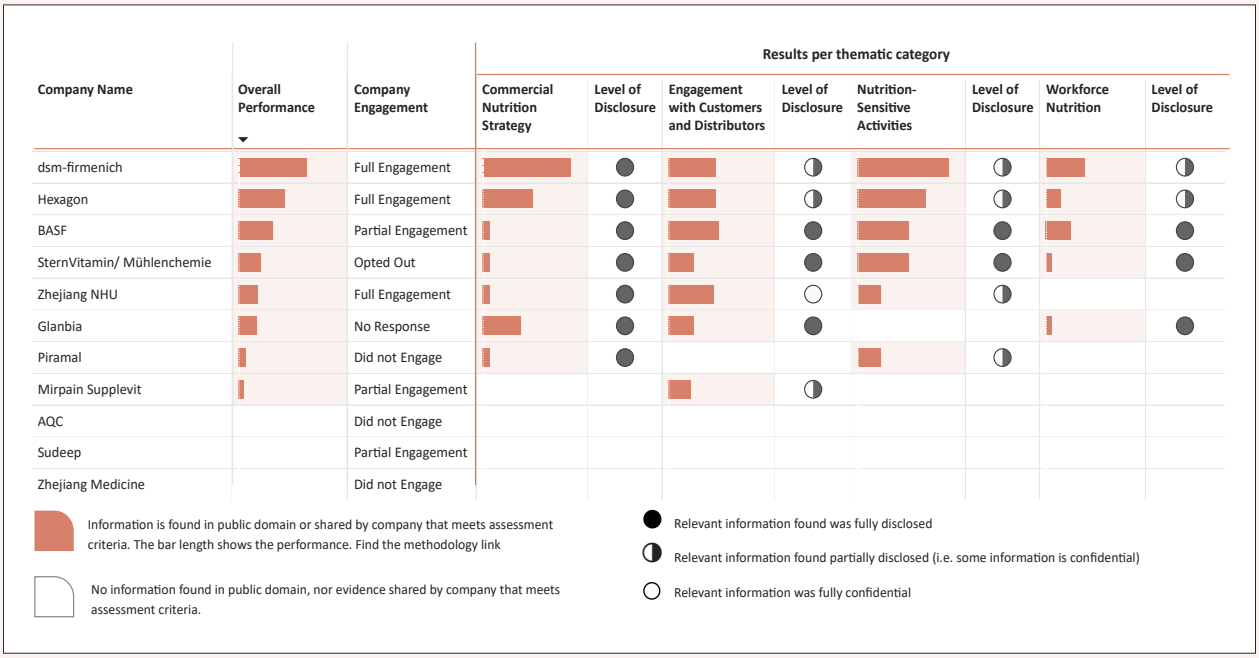
Nutrition-Sensitive Activities: Five of the 11 companies extend technical assistance to millers beyond their direct customer base, with dsm-firmenich and Hexagon providing structured support. Notably, dsm-firmenich links its assistance to measurable targets, enhancing accountability.

Broader collaborative fortification efforts—such as supporting the implementation of regulations, subsidizing premix, or donating equipment—were also identified for five companies (BASF, dsm-firmenich, Hexagon, SternVitamin/Mühlenchemie, and Zhejiang NHU). However, limited disclosure of the planned activities, their scope and objectives makes it difficult to assess the implementation and impact of these efforts.

Workforce Nutrition: Five companies—BASF, dsm-firmenich, Glanbia, Hexagon, and SternVitamin/Mühlenchemie—disclosed initiatives aligned with at least one workforce nutrition pillar (healthy food at work, nutrition education, nutrition-focused health checks, and/or breastfeeding support). BASF and dsm-firmenich were found to offer parental leave beyond legal requirements in some countries. However, no company has a comprehensive workforce nutrition policy covering all four pillars, and most do not disclose whether support is provided consistently to all employees and across all worksite locations.

FIGURE 1

VITAMIN ASSESSMENT: OVERALL PERFORMANCE, PERFORMANCE AND LEVEL OF DISCLOSURE ACROSS CATEGORIES, AND LEVEL OF ENGAGEMENT BY COMPANY



Insights from India and Kenya

Stakeholders interviewed provided examples and insights into the pivotal role of fortificant producers in supporting food fortification. However, small- and medium-sized fortificant producers face several significant challenges that limit the effectiveness and reach of food fortification efforts. These include weak regulatory standards and enforcement, limited technical capacity and quality assurance, supply chain disruptions, and unregulated pricing resulting from a lack of a level playing field.

Larger fortificant producers can play a key role by:

- **Improving Accessibility to Fortificants:** Global fortificant producers collaborate with local distributors and development partners to expand market reach. They work closely with distributors to ensure they have the technical capacity to preserve product quality during transport. Some fortificant suppliers also accommodate smaller food producers by offering fortificants in smaller packages. These efforts make fortificants more available and affordable across diverse market segments.
- **Enabling Effective Fortification:** Local suppliers support the correct use of fortificants by providing tailored technical assistance—particularly to food producers new to fortification. This includes guidance on optimal storage conditions (e.g. temperature and moisture control) and equipment use, which is especially relevant for smaller producers who often request such assistance. Some local suppliers also provide access to laboratory facilities for product testing and training on analytical techniques, helping food producers build capacity and confidence in fortification practices. In addition, some suppliers offer food producers free quality checks on products they supplied, especially when nearing expiry.

The country case studies also highlight the role of stakeholders in the wider value chain, such as food producers and governments, in driving successful fortification. Food producers can play a critical role by demanding higher quality fortificants and greater transparency, while governments can create a level playing fields through clear fortification standards, stronger monitoring and enforcement, and supportive policies.

CONCLUSION

Fortificant suppliers have significant potential to positively influence nutrition outcomes with their products and beyond—through their customer base, across the value chain, and within their own workforce. The VitaMin Assessment of 11 of the world's largest micronutrient and premix producers highlights several examples of these companies' nutrition-related efforts. However, these examples were largely incidental. **The assessment found limited systemic and routine disclosure, as well as a lack of clarity regarding the objectives, scope, and results of nutrition activities among most micronutrient and premix producers.**

As a result of this assessment, ATNi has seen improved transparency from Hexagon on its website, demonstrating that **greater transparency is both achievable and meaningful.** The company's improved disclosure underscores the value of the assessment framework in guiding producers towards more structured and accountable nutrition-related practices, setting a precedent for others in the industry to follow.

To fully harness this potential, **sector-wide alignment is needed to clearly define the role of fortificant producers** and establish explicit expectations and minimum performance standards. **Effective market and policy incentives are also essential** to drive more strategic and responsible corporate practices, particularly when nutrition is embedded within core business strategies.

The VitaMin Assessment is the first of its kind to monitor the role of B2B suppliers in the food fortification value chain. ATNi hopes and expects to see improvements in this space, as demonstrated by the progress already achieved through its indexes and assessments of consumer-facing food companies.

RECOMMENDATIONS

The assessment provides actionable recommendations to strengthen accountability and transparency across the fortification sector. In addition to guiding industry efforts, the findings are intended to also inform policymakers, investors, and civil society—who play a critical role in enabling and incentivizing responsible business practices that improve global public health outcomes.

TABLE 1
OVERVIEW OF ATNI'S RECOMMENDATIONS BY STAKEHOLDER GROUP

Stakeholder	ATNi Recommendations
Fortificant Producers	**1) Safeguard Fortificant Quality across the Value Chain** Fortificant producers should ensure high-quality sourcing and production is aligned with national standards and dietary needs. This includes implementing strict handling and storage practices—both directly and through distributors—and aligning practices with global guidelines, such as the Pan-American Health Organization (PAHO) Code of Practice for Food Premix Operations. **2) Strengthen Fortification through Structured Efforts and Partnerships** Companies are encouraged to embed nutrition into their core business strategies with clear goals and robust monitoring frameworks that reflect both business priorities and nutrition impact. Structured support—such as training, quality control, and targeted programmes for vulnerable populations—can be scaled up through shared-value partnerships with governments and development partners to amplify impact and foster sustainable progress. **3) Promote Transparency** Companies should disclose the scope, objectives, and outcomes of their nutrition strategies and fortification-supporting activities, emphasizing measurable achievements. **4) Foster Peer Learning and Innovation** Companies should share successful practices and innovative solutions—for example, through initiatives such as Millers for Nutrition. Demonstrating the tangible benefits of fortification helps build momentum and encourages broader adoption across the sector.
Policymakers	**1) Harmonize Fortification Standards and Practices** Governments should coordinate with national, regional, and global stakeholders to develop clear, evidence-based standards for micronutrients, premixes, and fortification processes. These standards must be regularly updated, context-specific, and supported by technical training and guidance to ensure industry compliance and alignment with public health priorities. **2) Strengthen Monitoring and Enforcement** Governments are encouraged to integrate fortification monitoring into existing food safety systems, establish digital traceability tools, and build regulatory capacity to enhance efficiency and enforcement. **3) Reduce the Costs of Fortification** Policymakers should remove import taxes and customs duties on fortificants, subsidize key fortification inputs, and benchmark fortificant prices to ensure fairness. Incorporating fortified foods into public distribution and social safety net programmes can further strengthen the market for LSFF and enhance accessibility.
Investors	**Allocate Capital to Fortificant Producers that Demonstrate Leadership in Quality, Transparency, and Public Health Impact.** Key indicators include: • Conducting and disclosing independent audits of quality control systems; • Supplying fortificants that comply with national standards and regulations; • Applying consistent practices across markets aligned with global guidelines; and • Ensuring affordability and accessibility in high-need markets. Transparent reporting on fortification activities and outcomes further strengthens accountability and impact.

CONTEXT

ADDRESSING HIDDEN HUNGER THROUGH FOOD FORTIFICATION

Micronutrient deficiencies remain one of the most widespread forms of malnutrition, and are estimated to affect more than half of preschool-aged children and two-thirds of non-pregnant women of reproductive age globally.[11] Micronutrients include vitamins (e.g. vitamin A or folate) and minerals (e.g. iodine and iron) that are naturally present in a diversity of foods and required in very small quantities for healthy bodily function.[12]

Micronutrients deficiencies can therefore lead to severe health and nutrition consequences.[13-15] Iron deficiency, for example, is one of the most common causes of anaemia, while inadequate iodine intake disrupts hormone production vital for growth and cognitive development.[16,17] Vitamin A is essential for healthy vision, while folate (vitamin B9) is crucial for preventing neural tube defects during early pregnancy.[18,19]

Recent research indicates that the majority of the global population consume inadequate levels of key micronutrients: more than 5 billion people consume insufficient amounts of iodine, vitamin E, and calcium, and over 4 billion people have an inadequate intake of iron, riboflavin, folate, and vitamin C.[13] Infants, young children, and pregnant women—particularly in LMICs are at higher risk of micronutrient deficiencies and bear a disproportionate share of the global burden.[3,12]

Although balanced and diverse diets can theoretically provide all the vitamins and minerals required for a healthy life, achieving such diets is not always possible or effective.[20] Many groups face challenges in reaching adequate micronutrient levels from their diets alone, particularly when unfortified staples and/or unhealthy foods (high in sugar, fat and salt, and low in vitamins and minerals) form a prominent part of diets.[21] Groups with higher micronutrient needs, such as older infants, adolescents, pregnant and breastfeeding women, as well as elderly people who might be eating less, are often at greater risk of micronutrient deficiencies.

The fortification of commonly consumed foods such as flour, edible oil, rice, milk, and salt can provide essential micronutrients that are not delivered in adequate amounts through diet.[20,22] This is particularly the case in LMICs, where access to diverse and nutrient-rich diets may be limited. In these contexts, food fortification can be an effective public health strategy for addressing micronutrient deficiencies.[3,20,23]

There are multiple techniques to fortify foods, including industrial fortification, biofortification, and home fortification. The most widely used is industrial food fortification, in which fortificants are added to foods during processing.[24] In this report, the term **fortificant** is used to refer collectively to both single micronutrient compounds (e.g. retinyl palmitate) and vitamin and mineral premix blends used to fortify foods and beverages.[24,26,a,b]

[a] Retinyl palmitate is a stable, synthetic form of vitamin A used in food fortification to prevent vitamin A deficiency, often in staple foods like vegetable oil, cereal flours, and sugar.

[b] Premixes are commercially-prepared, customized blends of vitamins and/or minerals in which each nutrient component is pre-scaled and precision blended into a form that is then added to food vehicles.[16]

Various methods and approaches of food fortification are used to address micronutrient deficiencies among individuals and populations (see Table 2). **Large-scale food fortification (LSFF)** is a nutrition-specific intervention, regulated by government, that deliberately adds one or more essential micronutrients (fortificants) to a staple food or condiment for the purpose of correcting or preventing micronutrient deficiencies in populations at increased risk.[27] This approach is particularly effective in reaching large segments of populations in LMICs, improving micronutrient status. It is an untargeted intervention that is safe for all.[28,29] LSFF is typically mandated by government policy and implemented at the food processing level, ensuring broader coverage. Globally, fortification regulations have most commonly been applied to iodine, iron, vitamin A, and increasingly, folic acid.[30]

TABLE 2
METHODS OF FOOD FORTIFICATION[24,31]

Large-scale food fortification (LSFF)	Targeted fortification	Market-driven fortification
Fortification of foods widely consumed by the public, such as flour, oil or salt, with essential micronutrients, often mandated by government regulation.	Fortification focused on specific groups such as pregnant women or children, e.g. ready-to-use therapeutic foods or complementary foods for infants.	Fortification led by the private sector but within government-set regulatory limits, where food manufacturers voluntarily fortify a diverse range of food products.[6]

Fortification can also be market-driven, whereby food manufacturers voluntarily add one or more micronutrients to processed or packaged foods, often in response to consumer demand for healthier products.[24,32] Market-driven fortification includes a wide range of processed and packaged products, such as breakfast cereals fortified with iron and B vitamins, or beverages with added calcium.[24] In higher-income countries, in particular, this approach has gained popularity, as consumers are willing to pay premium prices for nutrient-enriched foods.

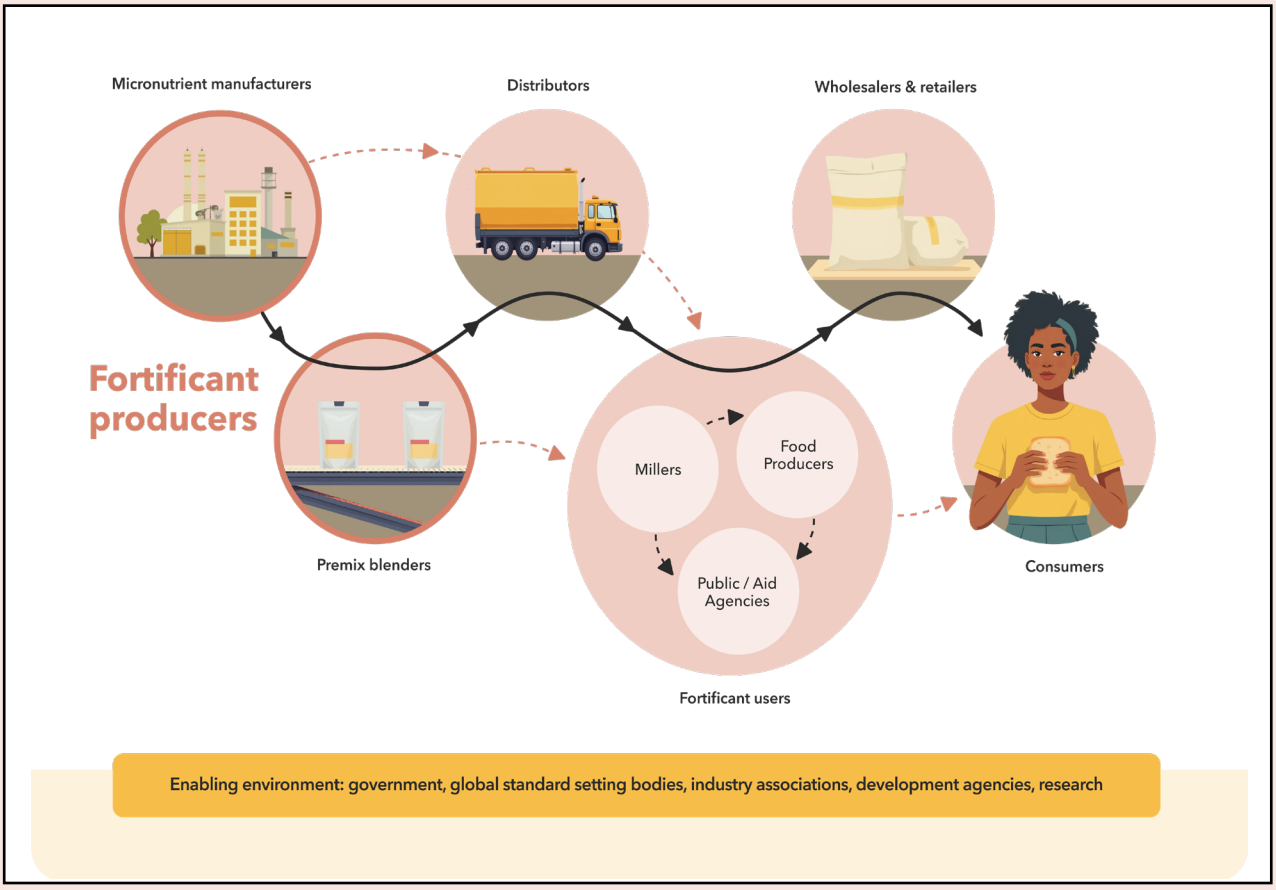
However, within **market-driven** fortification, food and beverage (F&B) manufacturers may choose to add vitamins and minerals to food products with excessive salt, fat, and sugar levels, which can mask their overall poor nutritional value and lead consumers to make less favourable nutritional choices.[33,34] Therefore, the impacts of market-driven fortification are limited by regulatory oversight of health claims, consumer awareness, and purchasing power—often excluding low-income populations who need fortified foods the most.[24,35]

The distribution and final use of fortificants exists within a highly complex supply chain involving several different actors (see Figure 2). **Fortificant producers** refers to both manufacturers of single micronutrients and companies that formulate premix blends. Micronutrient manufacturers may supply their products directly for fortification or sell them to companies that combine multiple micronutrients into a premix blend, which is also in turn used for fortification. Some companies produce both single micronutrients and premix blends.

The fortificants produced by these companies are supplied to **fortificant users**, who add them to a given food vehicle. If the companies are not supplying fortificants directly to end users, they rely on third parties—**distributors**—to deliver products effectively and safeguard their quality. Users may include millers, food producers, or public/aid agencies, depending on the type of vehicle intended for fortification, and the desired end use.

Fortificant producers must therefore develop customized micronutrient and premix formulations to meet specific product fortification requirements while ensuring compliance with national and global standards. The fortified staple or food product is then either directly sold to **consumers** or distributed through **wholesalers and retailers (commercial channels)**. Fortified products can also be supplied to consumers through **non-commercial channels**—free of charge or at subsidized rates—as part of social protection programmes or humanitarian aid efforts, via public or aid agencies. Millers may also sell fortified staples to food producers and public or aid agencies, who use them as ingredients to produce fortified products.

FIGURE 2
FORTIFICATION SUPPLY CHAIN



PROGRESS AND CHALLENGES IN FOOD FORTIFICATION

Substantial progress has been made in expanding food fortification regulations as a strategy for preventing micronutrient deficiencies, particularly in LMICs.[32] At present, 143 countries have fortification standards for at least one food vehicle, with legislation for the iodization of salt being the most popular with 126 countries having mandatory legislation.[7] This legislation, together with a strong enabling environment for salt fortification (e.g. multisectoral leadership, minimal costs, and infrastructure adjustments), has contributed to significant progress: the number of countries experiencing iodine deficiencies declined from 113 in 1993 to 23 in 2025.[36,37] However, few programmes beyond salt iodization have achieved comparable success.[36]

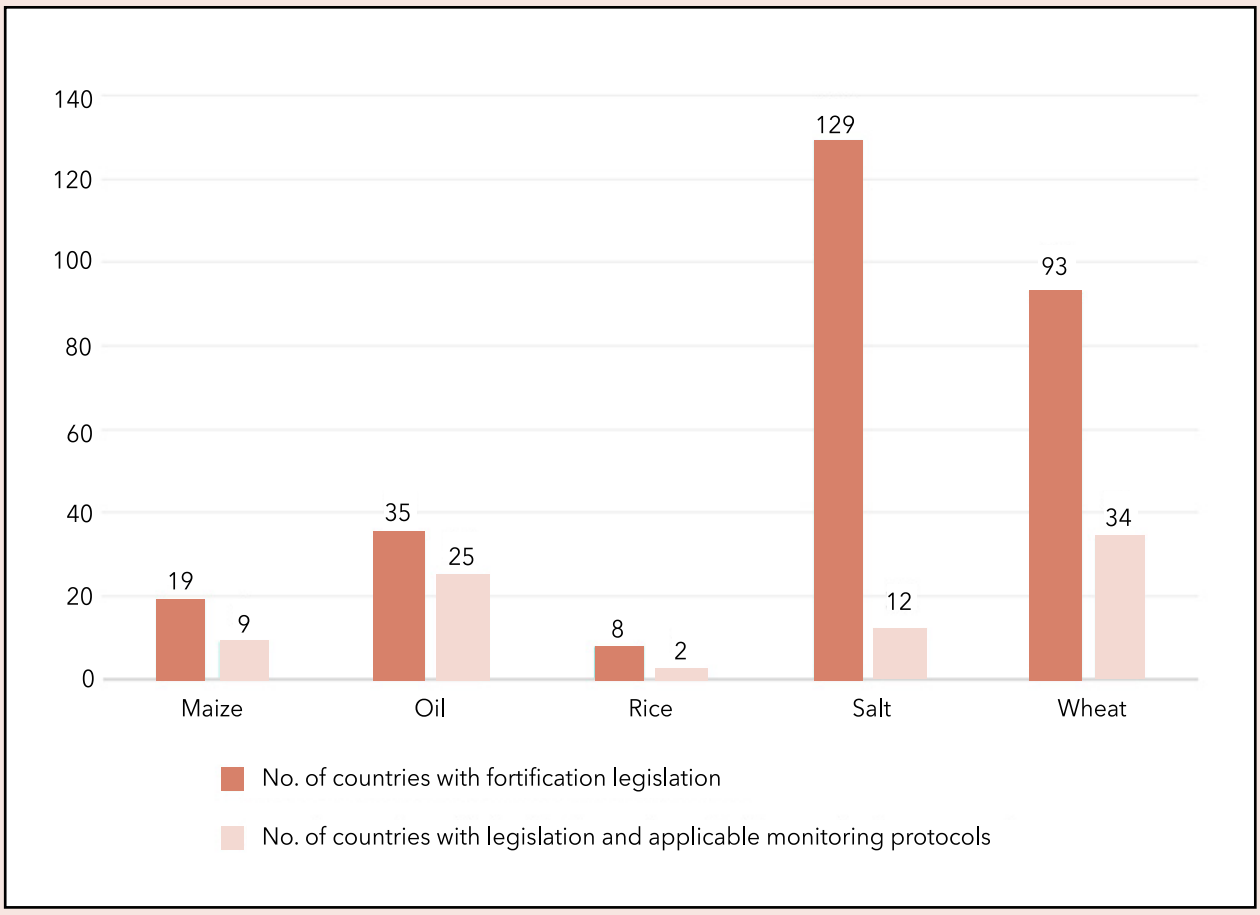
Though data on the population coverage and quality of fortified foods are limited, evidence suggests that fortified foods often fail to meet the micronutrient levels stipulated in national standards, limiting the effectiveness of fortification programmes.[22,36,38] A 2020 review of LSFF programmes in 16 countries highlighted substantial gaps between the levels of households consuming fortified food, and those consuming food sufficiently fortified according to national standards.[23] For example, while 15% of households consumed fortified wheat flour and 22% consumed fortified maize flour, only 5% and 3% respectively, were consuming adequately fortified flours according to national standards.[23,c,d]

[c] Proportion of households consuming fortified wheat flour based on 16 surveys.
[d] Proportion of households consuming fortified maize flour based on eight surveys.

These gaps in consumption of adequately fortified foods are largely due to low compliance with regulation, generally resulting from weak monitoring and enforcement both internally (by fortificant and food producers) and externally (by governments).[22,35,38] The Global Fortification Data Exchange highlights that although many countries have fortification legislation, few have applicable protocols for monitoring the import and production of fortified foods (see Figure 3). For example, of the 93 countries with mandatory wheat flour fortification, only 34 have protocols for carrying out both internal and external monitoring activities. Such protocols support consistency in fortification practices, guide inspections, and help ensure fortification quality is maintained.[39]

FIGURE 3

NUMBER OF COUNTRIES WITH APPLICABLE MONITORING PROTOCOLS FOR MANDATORY FORTIFICATION LEGISLATION (IMPORT AND PRODUCTION OF FORTIFIED FOODS)



Source: Global Data Fortification Exchange (2025)

Improving clarity and enforcement of regulations can support quality fortification across the value chain. However, both government regulators and industry actors face multiple challenges in monitoring and implementing fortification regulation. Governmental bodies, for example, may face challenges with limited funding for broad and regular monitoring, particularly in contexts with several small-scale millers.[10] Government inspectors may also face constraints such as limited laboratory equipment and insufficient training to conduct regular quality controls on fortificant users and producers.[22,38]

For fortificant producers, the absence or ambiguity of standards can hinder the development of appropriate formulations and the implementation of effective internal monitoring processes.[38,40]

At the distribution level, poor handling practices can degrade fortificant quality. The effectiveness of fortified foods is strongly influenced by the stability of the micronutrients, which are susceptible to degradation by moisture, oxygen, and other ingredients in the food matrix.[31,41] Proper handling, storage, and packaging during both distribution and production are required to take these specifications into account and ensure the quality of fortificants, and fortified end-products.[31,41]

Challenges encountered earlier in the value chain may create further constraints for fortificant users (i.e. F&B manufacturers) particularly in sourcing high-quality fortificants.[22] However, even when quality fortificants are available, producers may have limited capacity and resources to adequately fortify products.[22] This is especially true for small- or medium-scale food producers, such as maize flour millers, who may lack the technical and financial capacity for the necessary machinery and personnel to carry out internal quality control or assurance.[42] Passing these costs to consumers through more expensive end-products can make fortification less attractive to smaller-scale producers, particularly when consumer awareness or demand for fortified products is low.[42,43] Particularly in LMICs, this can be a key barrier for smaller-scale millers, who are an important source of staple foods for price-sensitive lower-income consumers.[10]

Lastly, across the value chain—particularly in contexts with weak monitoring and enforcement— competition from non-compliant fortificant producers and users further reduces incentives to fortify adequately and in line with national standards.[38]

These multiple challenges highlight the need for an enabling environment that supports all actors across the value chain to achieve effective fortification.[36]

THE ROLE OF INDUSTRY

Industry actors across the fortification value chain have a responsibility to improve diets and address malnutrition through their commercial practices.

F&B manufacturers may be more visible in shaping consumer diets; however, fortificant producers—as key ingredient suppliers—also play a vital role in the broader food system and influence public health nutrition outcomes. It is important that fortificant producers recognize their role in supporting healthier diets through responsible business practices.

Opportunities for fortificant producers to contribute to food fortification—beyond merely supplying fortificants—are numerous. Global producers can offer affordable pricing and strong support to customers in areas with high rates of micronutrient deficiencies. With greater financial and technical capacity, these

suppliers are also well positioned to support their customers through technical assistance, including training and the provision of equipment.[10]

Fortificant producers' provision of technical assistance to fortificant users can promote access to new markets, increase sales, and enhance reputation. Partnerships between fortificant producers, F&B manufacturers, and the public sector can also deliver resources to drive improvements in public health.[36]

Fortificant producers can also influence consumer diets by guiding their customers to use fortificants in healthier food products (i.e. those low in saturated fats, salt, and sugar) while avoiding the promotion of fortification in less healthy foods. This is particularly important as manufacturers are increasingly fortifying products high in salt, fat, and sugar with vitamins and minerals, masking the poor overall nutrition of the product.[33,34] This was reflected in ATNi's 2024 Global Index, which assessed 30 of the world's largest F&B companies. Of the 12,019 products for which fortification information was available, 28% were fortified with one or more micronutrients. Of these fortified products, 36% did not meet the "healthier" threshold of a Health Star Rating of 3.5 or above.[44]

The World Health Organization (WHO), and its regional arm, the Pan American Health Organisation (PAHO), recognize the key roles and responsibilities of fortificant producers in effective food fortification through the development of the Code of Practice for Food Premix Operations.[35] More recently, the influence of fortificant suppliers has been recognized through initiatives such as Millers for Nutrition (M4N), an industry-led global coalition of millers, technical partners, fortificant producers, and stakeholders across the fortification value chain, which aims to support millers in LMICs in producing adequately fortified nutritious foods.

BOX 1
EXISTING INITIATIVES SUPPORTING INDUSTRY FOOD FORTIFICATION

Several initiatives aim to create an enabling environment for quality fortification, recognizing the key roles and responsibilities of industry actors.

In 2009, the Global Alliance for Improved Nutrition (GAIN), established the GAIN Premix Facility (GPF), a non-profit global procurement platform that supports industries, governments, and international agencies in sourcing quality food fortificants.[46]

Technoserve, a global non-governmental organization, is actively involved in creating enabling environments for food fortification through multiple programmes that focus on building industry capacity and fostering public-private partnerships. These include Strengthening African Processors of Fortified Foods, the Technical Assistance Acceleration Program, and the Micronutrient Fortification Index, which explores the quality of staple fortification in Nigeria.[47-49] In 2023, Technoserve also contributed to the establishment of M4N.[50]

The Food Fortification Initiative operates as a public, private, and civic partnership, providing technical assistance to governments, regional bodies, and food producers to plan, implement, and monitor the fortification of industrially milled wheat flour, maize flour, and rice.[51]

Nutrition International works in several countries to facilitate multistakeholder coordination in the food fortification landscape and to provide technical assistance to governments, implementing agencies, and food producers.[51]

The Micronutrient Forum serves as a global hub for evidence-based advocacy to address micronutrient deficiencies. As a platform, it convenes experts and implementers, identifies knowledge gaps, and sets shared priorities, with food fortification as a key advocacy area.

BUSINESS CASE FOR FORTIFICATION

Food fortification is widely recognized as an effective strategy to address micronutrient deficiencies and is linked to reduced burdens on public healthcare and improved physical productivity at the population level.[52] Anaemia, for example, was estimated to have caused 50 million years of healthy life lost due to disability in 2019.[17] Continued efforts to address these conditions are needed, with estimates from the State of Food Security and Nutrition in the World report highlighting that the global prevalence of anaemia in women aged 15-49 years has increased over the past decade, from 27.6% in 2012 to 30.7% in 2023.[53]

Though cost-effectiveness may vary by micronutrient and food vehicle, the relatively low unit cost of fortification generally ensures large benefits at both the individual and population level. For this reason, the Copenhagen Consensus and the World Bank rank fortification among the best investments in development.[54] It is estimated that every USD 1 invested in food fortification initiatives generates USD 27 in returns, through averted disease, improved earnings and enhanced productivity.[4]

Food fortification has also been shown to be less costly than other interventions for reducing micronutrient deficiencies. In East Africa, fortifying foods with iron, zinc, and vitamin A costs between USD 22 and USD 60 to prevent the loss of one DALY.[52] In comparison, providing the same micronutrients through supplementation costs approximately USD 50 to USD 250 per DALY saved.[52]

Through improved public health outcomes and increased productivity, food fortification has great potential to directly and indirectly contribute to multiple Sustainable Development Goals (SDGs): Zero Hunger (SDG 2), Good Health and Well-Being (SDG 3), Quality Education (SDG 4), and Decent Work and Economic Growth (SDG 8).[6]

VITAMIN ASSESSMENT: A NUTRITION ASSESSMENT OF FORTIFICANT PRODUCERS

Several multistakeholder partnerships bring together public and private sector actors to support effective fortification programmes. However, aligning business practices with the broader food systems transformation agenda—including accelerating progress towards SDG 2 (Zero Hunger)—requires greater transparency and accountability in company performance, including in the B2B sector. While some initiatives assess performance through fortificant quality, there is a broader need to understand how B2B companies can contribute to nutrition beyond supplying quality ingredients, especially in addressing systemic challenges across the fortification value chain. For the private sector to meaningfully advance the nutrition agenda, consensus is needed on the role and expected performance of fortificant producers, alongside clearer insights into their current practices.

By extending corporate accountability further up the supply chain, ATNi's VitaMin Assessment provides a first-of-its-kind evaluation that establishes a baseline of current practices among 11 of the largest global fortificant producers—highlighting positive practices that other companies can emulate, as well as opportunities to elevate the role of these B2B actors within the broader nutrition and food systems transformation agenda.

The findings are intended not only to guide industry efforts but also to inform policymakers, investors, and civil society—who have an important role in enabling and incentivizing responsible business practices that improve public health outcomes and fostering accountability across both the B2B and business-to-consumer sector.

The following chapter outlines the research and methodology behind the VitaMin Assessment, with subsequent chapters presenting the main findings and actionable recommendations.

METHODOLOGY

PURPOSE AND SCOPE

The VitaMin Assessment comprises two core components: a Corporate Profile and country case studies in India and Kenya.

The **Corporate Profile** evaluates the nutrition-related policies and practices of 11 of the world's largest fortificant manufacturers, including producers of vitamins, minerals, and premix blends. Together, these companies supply the majority of fortificants used in LSFF globally (see Company Selection).

The **country case studies**—India and Kenya—were selected to reflect contrasting fortification environments. Kenya represents a mandate-driven, import-dependent system in which staple foods such as wheat and maize flour, salt, and vegetable oils must be fortified by law and rely heavily on imported fortificants. India, by contrast, is a major global producer and exporter of premix inputs, with fortification largely voluntary or programme-driven and delivered through both commercial and public distribution channels. These case studies provide insight into how national fortification measures are implemented in practice and the roles played by fortificant suppliers, food producers, and regulatory agencies.

By combining company-level benchmarking with in-depth country insights, the VitaMin Assessment highlights positive practices and areas for improvement, guiding industry actors, policymakers, investors, and civil society in fostering responsible business conduct that supports the broader nutrition and food systems agenda.

Company Selection

Company selection for the Corporate Profile assessment was guided by a set of inclusion criteria designed to ensure relevance, comparability, and potential impact. Core criteria included the active supply of micronutrients and premix for LSFF programmes; significant operations or market presence in LMICs; global geographic reach; and supply into at least one of the two focus countries for the VitaMin case studies (Kenya and India). GPF certification was also a key requirement, reflecting recognized standards for fortificant quality and safety. Additional factors included whether companies were publicly listed (thereby enhancing transparency) and whether they participated in initiatives such as M4N.

A list of 11 of the largest global producers of micronutrients and premix was identified for inclusion in the VitaMin assessment, based on market intelligence from the Giract value chain analysis commissioned by the Gates Foundation, consultations with expert stakeholders, and publicly available information on company activity in LSFF and LMIC markets. An overview of these companies can be found in Table 3. These producers supply premix blends and single ingredients of vitamin A, iron, folic acid and zinc—micronutrients of global public health concern, particularly in LMICs.

TABLE 3

COMPANIES INCLUDED IN THE VITAMIN ASSESSMENT

Company[e]	Short Name used in Assessment	HQ	Private/ Publicly Listed
AQC Chemlab Private Limited	AQC	India	Private
BASF SE	BASF	Germany	Public
dsm-firmenich	dsm-firmenich	Switzerland, Netherlands	Public
Glanbia plc	Glanbia	Ireland	Public
Hexagon Nutrition Limited	Hexagon	India	Private
Mirpain Gıda San. ve Tic. A.Ş.	Mirpain Supplevit	Türkiye	Private
Piramal Pharma Limited	Piramal	India	Public
SternVitamin GmbH & Co. KG/ Mühlenchemie GmbH & Co. KG	SternVitamin/ Mühlenchemie	Germany	Private
Sudeep Nutrition Private Limited	Sudeep	India	Private
Zhejiang Medicine Co. Ltd.	Zhejiang Medicine	China	Public
Zhejiang NHU Co. Ltd.	Zhejiang NHU	China	Public

Of the 11 selected companies, several operate across sectors beyond food and human nutrition, including animal nutrition, cosmetics, industrial applications, and pharmaceuticals. For some companies, nutrition represents a relatively small part of their core business, yet they hold significant potential to influence nutrition outcomes—internally through their workforce, externally through their customers, and more broadly across the value chain.

METHODOLOGY SUMMARY

The VitaMin Corporate Profile is designed to assess the nutrition-related policies and practices of the world's leading B2B suppliers of micronutrients and premixes.[f] It also evaluates whether company commitments and practices are disclosed (where applicable) and whether they apply across all markets in which the companies operate. Building on ATNi's previous benchmarks, this assessment takes a targeted approach—focused specifically on food fortification—and adapts ATNi's existing assessment framework to companies operating at the upstream end of the fortification value chain.

A bespoke methodology and indicator framework were developed based on international fortification guidelines (including the WHO/Food and Agriculture Organization of the United Nations (FAO) fortification guidelines and the PAHO Code of Practice for Food Premix Operations) and refined through consultations with public, private and civil society stakeholders, including ATNi's advisory group for this assessment. Companies are assessed only on areas where they go beyond existing regulatory requirements; ATNi does not assess compliance with regulation or the law. The assessment recognizes that "best-in-class" manufacturers are not only producing high-quality fortificants but are also taking active steps to ensure quality is maintained and effective fortification is achieved further down the supply chain—particularly in LMICs—through responsible business practices.

[e] Note: Company names refer to the parent company unless otherwise stated below.
- DSM-Firmenich AG is the parent company of dsm-firmenich.
- Piramal Enterprises Limited is the parent company of Piramal.
- Stern-Wywiol Gruppe is the parent company of SternVitamin and Mühlenchemie.
- Sudeep Pharma Private Limited is the parent company of Sudeep.
- NHU Holding Group Co. Ltd. is the parent company of Zhejiang NHU.

[f] ATNi's Indexes assessing B2C F&B companies—such as the Global Index 2024, Kenya Market Assessment 2025, and India Index 2023—include indicators that track fortification commitments and practices, and their alignment with international fortification guidelines by WHO, FAO and Codex.

The Corporate Profile assessment uses a set of indicators structured under four thematic categories: 1) the inclusion of nutrition within core business strategies, 2) support provided to food manufacturers and distributors to ensure the safe and effective handling and use of fortificants, 3) broader efforts to support fortification, especially in high-burden markets, and 4) workforce nutrition measures. To capture LMIC relevance, specific evidence was requested from Kenya and India—the two case study countries—and companies were invited to demonstrate how practices are operationalized in these contexts. The full list of indicators is available in the VitaMin Assessment 2025 Methodology. Table 4 presents an overview of the four categories and the key elements assessed within each.

To complement the corporate-level assessment and provide on-the-ground context, qualitative case studies were conducted in Kenya and India using key informant interviews and secondary data review to investigate how fortificant suppliers interact with food manufacturers, regulators and other stakeholders within national fortification systems. Interview guides were designed to mirror the themes covered in the Corporate Profile (see Table 4), enabling comparison between companies' stated commitments and the practical realities experienced by actors in national supply chains, and were tailored to different stakeholders. Together, the Corporate Profile and country case studies provide a structured approach to evaluating the contribution of fortificant manufacturers to effective fortification in LMICs and to identifying the policy and market conditions that enable, or hinder, progress.

TABLE 4

OVERVIEW OF THE VITAMIN ASSESSMENT CORPORATE PROFILE METHODOLOGY

Category	Scope	Elements Assessed	
Commercial nutrition strategy	Core business operations	• Integration of public health nutrition goals into business strategy, beyond merely supplying fortificants. • Governance structures supporting these nutrition goals.	Transparency and geographic scope
Engagement with customers and distributors	Commercial operations across the supply chain	• Structured collaboration with customers to deliver effective technical support and develop fortificants tailored to the intended market and in compliance with national regulations and dietary guidelines, while meeting customer specifications . • Formal engagement with distributors to ensure proper handling and storage across the supply chain to maintain fortificant quality.	
Nutrition-sensitive activities	Broader initiatives i.e. not targeted at customers	• Structured contribution to broader fortification efforts across the global food value chain.	
Workforce Nutrition	Internal (company employees, including office and factory workers)	• Implementation of nutrition interventions at scale to support the nutritional well-being of all employees globally.	

RESEARCH PROCESS

The Corporate Profile research followed a structured process beginning with the development of an indicator framework and company selection, followed by an initial assessment carried out by ATNi researchers using publicly available information. Each selected company was provided with access to its assessment on ATNi's online data gathering platform (Probench) to share additional input and evidence. Prior to accessing the survey, companies were invited to attend a training hosted by ATNi, which introduces the assessment framework and research process that involves two rounds of company engagement.

In the first round, companies were encouraged to provide information and supporting evidence that is either publicly available or confidentially shared with ATNi, with the option of doing so under a non-disclosure agreement. ATNi researchers reviewed these submissions iteratively, engaging in bilateral clarification calls with companies where necessary to verify claims, address data gaps and obtain supporting documentation. Participation in the assessment was voluntary. For non-engaging companies, researchers relied on information available in the public domain.

The Corporate Profile assessment period ran from March 2025 till mid-June 2025. Once completed, each assessment was peer reviewed by another member of the research team to ensure consistency, accuracy, and impartiality.

For the country case studies, a mixed-methods approach was applied comprising desk-based review of academic and grey literature, policy documents and market reports, combined with semi-structured key informant interviews conducted in Kenya and India. Stakeholders interviewed included government officials, regulators, larger and medium-sized food and fortificant manufacturers , industry associations, and development partners. Insights from the interviews and desk research were triangulated to produce consolidated country narratives.

RESEARCH LIMITATIONS

While the Corporate Profile aims to provide a comprehensive assessment of fortificant manufacturers' policies and practices, it is based primarily on self-reported data submitted by companies. It is assumed that all publicly reported and privately disclosed data is accurate, and ATNi requires companies to provide evidence to substantiate their statements. As this was an initial assessment, and considering resource requirements, it was not feasible to conduct independent, on-the-ground assessments of companies' products (i.e. product testing) or practices.

This is also the first application of the methodology to B2B companies operating in upstream fortification supply chains; thus, some indicators have limited historical benchmarks, and company policies in this area are still evolving. Time constraints may also limit the amount of evidence that companies share. In addition, participation in the assessment is voluntary; therefore, insights are limited to those companies willing to engage in the process. The actual performance of non-engaging companies, or companies with limited engagement during the research process, may not be fully captured. As a result, the findings of the VitaMin Assessment may not reflect the full extent of companies' actions to support effective fortification and improve nutrition.

For the country case studies, findings draw on a combination of published data and stakeholder interviews. The availability of national data on premix supply chains and fortification compliance varies, particularly in informal market segments, resulting in evidence gaps in certain areas (e.g. premix import volumes, premix quality testing, and market coverage in rural settings). While interviewees were selected to capture diverse perspectives, the number of stakeholders available was limited and may not fully represent all actors within the fortification system. These qualitative insights should therefore be interpreted as illustrative of trends and challenges rather than exhaustive.

OVERALL RESULTS

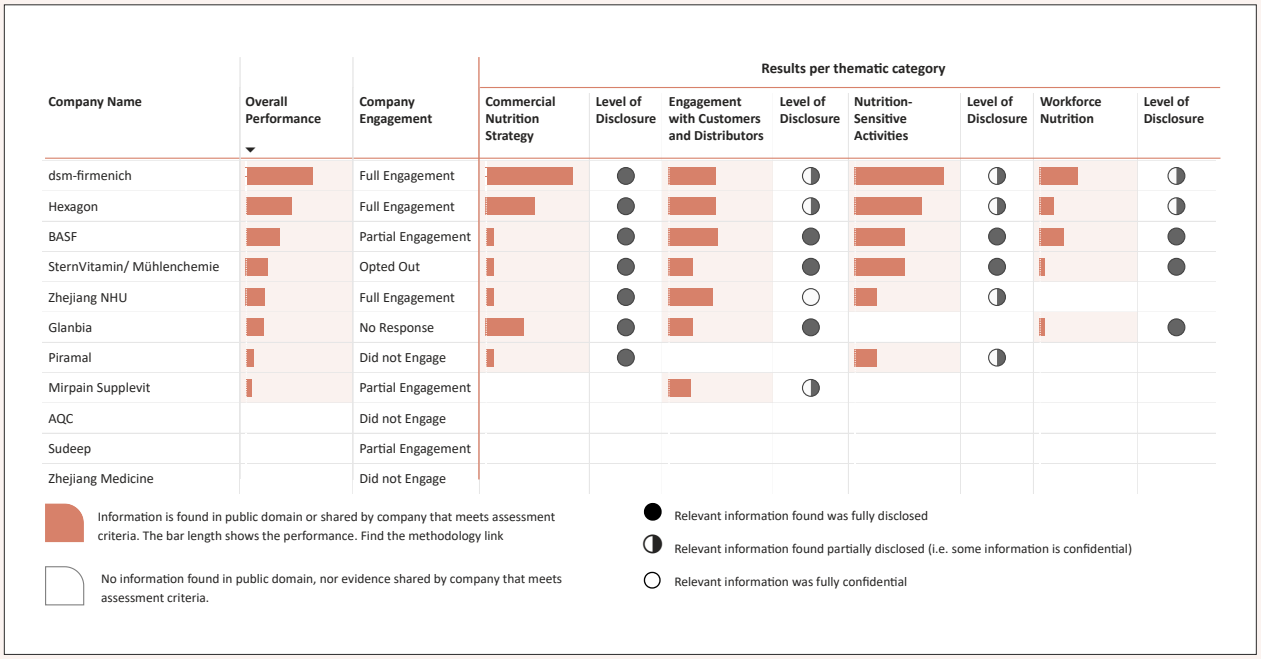
The level of engagement, total performance, and quality of publicly available information varied significantly across the companies assessed in the VitaMin Assessment, as shown in Figure 4. dsm-firmenich demonstrated the most comprehensive alignment with the assessment criteria, engaging fully in both rounds of the process and providing detailed feedback supported by evidence. This high level of engagement enabled a more complete and nuanced understanding of the company's nutrition-related commitments and practices. Alongside dsm-firmenich, Zhejiang NHU and Hexagon also fully engaged with the assessment, submitting feedback and documentation that contributed meaningfully to the evaluation. Notably, after the second round of engagement, Hexagon updated its website and published additional information, some of which was considered in the VitaMin assessment where relevant.

Other companies showed more limited participation. BASF, Mirpain Supplevit, and Sudeep engaged partially, offering some feedback but with minimal or no supporting evidence. Their input, while helpful in certain areas, was insufficient for a full assessment of their practices. Piramal, AQC, and Zhejiang Medicine were onboarded but did not provide any documentation or feedback. SternVitamin/ Mühlenchemie opted out of the engagement process after onboarding, and Glanbia did not respond to outreach efforts at any stage.

The assessment explored four thematic areas. In the category of **commercial nutrition strategy**, most companies disclosed information; however, in many cases, the content did not meet the assessment criteria, as it lacked the depth and specificity required for a meaningful evaluation.

FIGURE 4

VITAMIN ASSESSMENT: OVERALL PERFORMANCE, PERFORMANCE AND LEVEL OF DISCLOSURE ACROSS CATEGORIES, AND LEVEL OF ENGAGEMENT BY COMPANY



In contrast, the category on **engagement with customers and distributors** revealed more substantive practices. Several companies shared relevant information that met the criteria, although this was primarily submitted confidentially rather than being found in the public domain. While this limited the transparency of the findings, it nonetheless provided insight into how companies interact with their business partners around effective fortification.

The categories on **nutrition-sensitive activities** and **workforce nutrition** showed mixed levels of disclosure. While some companies provided information that aligned with the assessment criteria, the extent of disclosure varied. SternVitamin/Mühlenchemie and BASF fully disclosed some relevant practices in these areas, while most other companies offered only partial insights. This uneven level of transparency made it challenging to assess the full scope of companies' efforts to support nutrition-sensitive initiatives and workforce well-being.

The findings for each category are described in greater detail in the following sections of this report. Individual company performance across the categories is also reported in its respective result card. The findings from the country case studies are presented in more detail in a separate report, which can be found here.

CATEGORY

COMMERCIAL NUTRITION STRATEGY

CATEGORY CONTEXT

This category assesses whether, and to what extent, fortificant producers account for nutrition-related public health issues in their business strategy—beyond primarily supplying fortificants. It considers governance practices, transparency and whether companies recognize nutrition as a material business risk.

There are many opportunities for producers to take responsibility for respecting and supporting public health. For instance, fortificant producers can offer affordable pricing and strong support to customers in areas with high rates of micronutrient deficiencies. They can also provide proper guidance to customers on handling fortificants to ensure that quality is maintained through the value chain and nutrients reach customers. In addition, they can influence diets by guiding customers to use fortificants only in healthier food products—those that are low in saturated fats, salt, and sugar—while avoiding the promotion of fortification in less healthy foods, such as confectionery or sugar-sweetened beverages.

It is important to note that some of the 11 companies assessed operate across sectors beyond food and human nutrition, including animal nutrition, cosmetics, industrial applications, and pharmaceuticals. As a result, their global corporate strategies often reflect the complexity of diversified portfolio, with limited specific focus on human nutrition and fortification.

BOX 2

THE CONTROVERSY OF PROCESSED FOODS' FORTIFICATION AND CONSUMERS' HEALTH

Fortificants producers occupy a complex position in the food system, as they often also manufacture or distribute other ingredients commonly used in highly processed foods—including additives, artificial colourants, flavour enhancers, and texturizers. While certain levels of processing can provide clear benefits, such as improved food safety, longer shelf life and increased micronutrient content, these advantages should be leveraged to support the development of genuinely healthier food products.

Fortificants are sometimes used to create an impression of nutritional value in foods that are otherwise high in sugar, salt, or unhealthy fats. This can mislead consumers by emphasizing added nutrients while obscuring less desirable aspects of the product's overall nutritional profile. Prioritizing nutritional integrity alongside technological innovation is essential for promoting public health.

MAIN FINDINGS

None of the companies assessed have set or published a formal nutrition strategy and disclosure on efforts to address nutrition and public health challenges is very limited. While some companies have specific commitments in place, others disclose only broad statements about their role in nutrition, and most do not share anything publicly in this regard (See Figure 5).

FIGURE 5

CATEGORY PERFORMANCE AND LEVEL OF DISCLOSURE (BY COMPANY)

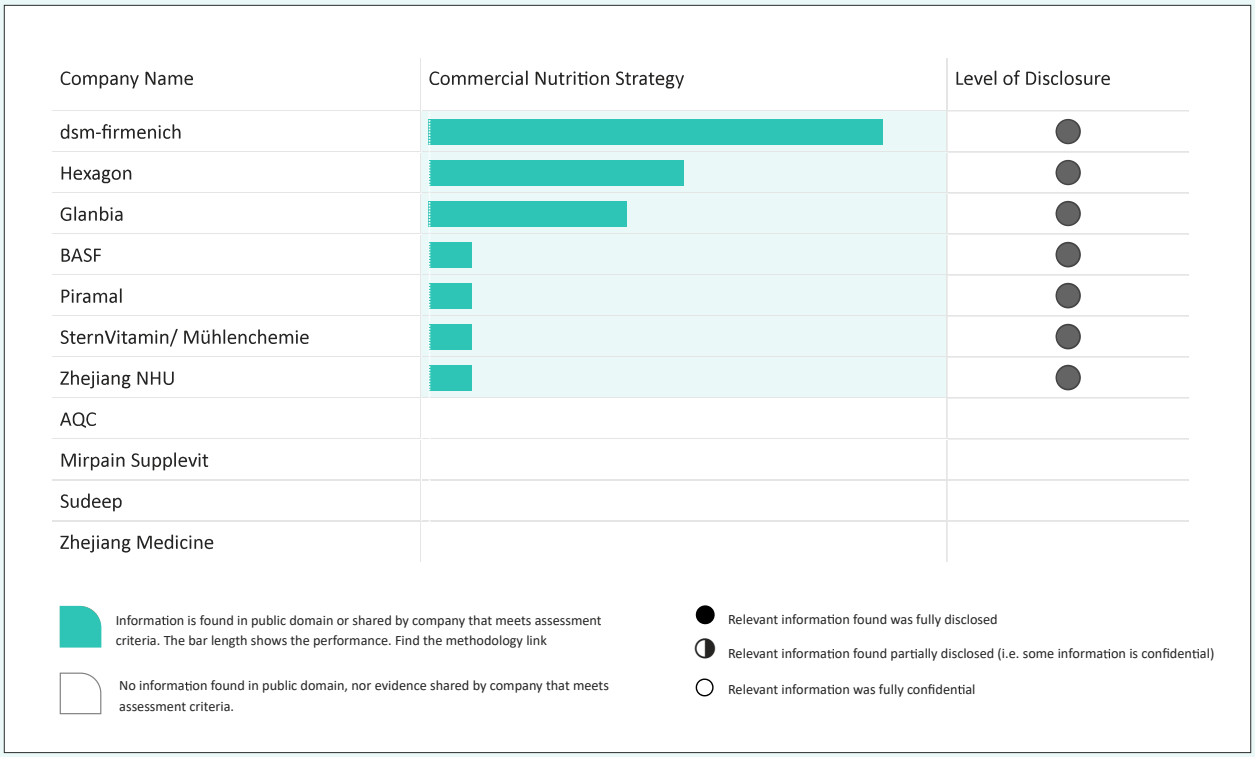


TABLE 5

SUMMARY OF NUTRITION COMMITMENTS, GOVERNANCE, AND REPORTING (BY COMPANY)

Company	Does the company acknowledge its role in addressing public health nutrition challenges?	Does the company set specific, measurable, and time-bound nutrition-related commitments?	Does the company report on the progress of the commitments?	Does the company assign accountability for the performance and implementation of the commitments?
AQC	No information	No information	No information	No information
BASF	Yes	No	No information	No information
dsm-firmenich	Yes	Yes	Yes	Yes
Glanbia	Yes	No	No information	Yes
Hexagon	Yes	Yes	Yes	No
Mirpain Supplevit	Yes	No	No information	No information
Piramal	Yes	No	No information	No information
SternVitamin/	Yes	No	No information	No information
Sudeep	No information	No information	No information	No information
Zhejiang Medicine	No information	No information	No information	No information
Zhejiang NHU	Yes	No	No information	No information

Commitments to Address Nutrition

To effectively integrate a nutrition lens into their core business operations, companies are encouraged to set nutrition-related commitments that are specific, measurable, and time-bound, and report publicly on baselines and progress using clear metrics. These commitments should be supported by robust governance structures to ensure successful implementation. Such actions would enhance credibility and position companies as leaders in addressing malnutrition through sustainable business practices. They would also enable stakeholders—such as investors, governments and development agencies—to assess company impact and alignment with global public health priorities.

Only two companies have set specific, measurable, and time-bound nutrition-related commitments as part of their corporate strategies. dsm-firmenich registered a broad commitment at the Nutrition for Growth (N4G) Summit to fill the nutrient gap of one billion people by 2030, striving to reach the third of the world's population lacking adequate nutrition through fortified staples and public health supplements.[55,56] The company publicly discloses detailed nutrition intervention strategies and cross-sector partnerships to fulfill this commitment across various channels and reports.[57-60] It is evident that the company strives to reach the commitment through both its business operations and its non-commercial activities (see 'Nutrition-Sensitive Activities' category).[61]

Hexagon is the second company to disclose nutrition-related commitments, outlining in its strategic roadmap a goal to reduce malnutrition globally through fortification business operations by 2030.[g] However, it does not define mechanisms for implementation.[62]

As part of its "Better Nutrition, Better World" sustainability strategy, Glanbia outlines some commitments linked to SDG 2 and SDG 3, including the development of cost-effective nutrition solutions and innovation to improve the nutritional profile of consumer products.[63] However, these commitments are not specific, measurable, or time-bound.

BASF, Mirpain Supplevit, Piramal, SternVitamin/ Mühlenchemie and Zhejiang NHU publicly share broad and general statements on recognizing their role in addressing public health nutrition challenges, without clearly defining how they aim to do so strategically through their fortification business operations.[64-68]

For the other three companies—AQC, Sudeep, and Zhejiang Medicine—no relevant information was found in the public domain or shared regarding commitments to address public health nutrition challenges.

Reporting on Nutrition Progress

In terms of reporting progress on commitments, dsm-firmenich is the only company that quantitatively tracks progress towards achieving its goals, relying on limited assurance audits conducted by a third-party organization, and publicly reporting the progress and impact of its nutrition projects.[59,69]

Hexagon discloses on its website some progress in addressing its commitments up to 2024-2025; however, the metrics are not clearly defined nor aligned with each strategic goal, incomplete, and lack a baseline. It is also unclear whether the company reports, or intends to report, on progress regularly (annually or biannually).[62]

For BASF, Glanbia, Mirpain Supplevit, Piramal, SternVitamin/Mühlenchemie and Zhejiang NHU, no public information was available on how these companies are progressing with their nutrition commitments.

[g] The roadmap was published on the company's website in May 2025 during the second phase of the assessment engagement.

Nutrition Governance

dsm-firmenich reports that accountability for the performance and implementation of its sustainability programme and targets is assigned to the executive committee—led by the CEO—and includes regular reviews.[59,69,70] Glanbia similarly reports that its Board oversees the regular review and performance assessment of the company's sustainability strategy, with formal responsibility for implementation assigned to the executive committee. While executive remuneration is linked to sustainability targets, these do not include nutrition-related objectives.[63] For the other companies, it is not clear how accountability for nutrition commitments is assigned.

Responsible Fortificant Sales

None of the companies specifically commit to prioritizing the sales of fortificants intended for products considered relatively healthy under nationally or internationally recognized nutrient profile models (NPM) endorsed by public health authorities (i.e. governments or intergovernmental bodies such as WHO and FAO), relative to total fortificant sales in market-driven food fortification.

Most of the companies—AQC, BASF, dsm-firmenich, SternVitamin/Mühlenchemie, Piramal, Glanbia, Mirpain Supplevit, Zhejiang NHU—disclose on their websites and in product brochures the range of food applications for which their fortificants are marketed, including soft drinks, cookies, cakes, muffins, waffles and confectioneries such as soft caramels, jelly beans, fizzy sweets, and compressed sweets, among others.[71-78] For instance, SternVitamin/Mühlenchemie mentions on its website: "Sweets or fruit gums, for instance, that contain the need-based vitamin mix and minerals such as calcium, are particularly suitable for children", while dsm-firmenich states: "Our confectionery experts can work with you to make your sweet treats even healthier—for example, through added vitamins and nutrients or our sugar-reduction tools."[71,72]

Hexagon highlights on its website the strategic priority of increasing premix sales for commercial food fortification in categories such as bakery, snacks and dairy. However, the company does not explicitly state it will avoid providing premixes for confectionery or that it will advise against fortifying these inherently unhealthy products, which contribute to increasing rates of diet-related non-communicable diseases (NCDs).[62] Mirpain Supplevit explained to ATNi that while its primary focus lies in combating malnutrition, it also strives to make micronutrient enrichment more affordable and to provide premixes not only for traditionally healthy foods but also for widely consumed, less nutritious products, stating: "We believe that improving the nutritional profile of all food categories can benefit public health; reaching consumers wherever they are, without causing harm." Sudeep noted that it is committed to supporting the fortification of food products in line with nutrient requirements recommended by public health authorities.

BOX 3
PERSPECTIVES OF INDIAN-BASED SUPPLIERS ON PREMIX FOR HEALTHIER FOODS

In September 2024, ATNi conducted in-person interviews with two of the largest premix producers in India, who shared their perspectives on supplying premix for different food applications.

- Pristine Organics expressed reservations about sugar fortification, citing concerns over its alignment with public health priorities amid escalating rates of obesity and malnutrition.
- Piramal noted that in order to thrive in such a competitive market, fortificant producers need to follow commercial trends, such as fortifying highly profitable products including energy drinks and confectionery. This makes it challenging to balance public health outcomes with market trends. Therefore, the company emphasized the need for a level playing field, where governments set regulations on what foods should or should not be fortified.

FIGURE 6
RESPONSIBLE SALES OF FORTIFICANTS

Nutrition-related Material Risks

Fortificant producers face a range of potential risks tied to public health nutrition—for example, future nutrition-related litigation from non-compliance with updated protocols, premix standards, or food legislation, as well as the reputational damage linked to the poor nutritional quality of fortified products. Recognizing and disclosing these risks not only enhances strategic resilience but also signals a proactive commitment to public health nutrition, which will strengthen stakeholder trust and support long-term value creation.

Out of the 11 companies assessed, Hexagon shared evidence with ATNi showing it considers several nutrition-related material risks, including nutritional quality and regulatory compliance. Five of the other ten companies—BASF, dsm-firmenich, Glanbia, Piramal, Zhejiang NHU—publicly disclose their risk management frameworks; however, the identified risks have a broader focus and do not explicitly address nutrition. Mirpain Supplevit informed ATNi that it includes some nutrition-related risks in its global risk assessment framework, covering regulatory changes in fortification and emerging public health concerns such as undernutrition and diet-related NCDs. However, no evidence was provided to substantiate this statement. For the remaining five companies, no relevant information was found in the public domain or shared with ATNi.

KEY RECOMMENDATIONS FOR FORTIFICANT PRODUCERS

To ensure that companies effectively leverage their global commercial operations and broader initiatives to support public health and nutrition goals, fortificant producers are encouraged to:

1 Evaluate

- **Assess all aspects of their business operations** that can positively impact public health nutrition and identify opportunities to improve this impact.
- **Identify and address all potential material nutrition-related risks across global operations**, ensuring they are captured in Enterprise Risk Management systems (or equivalent).

2 Transform

- **Develop a formal, structured plan** to address these areas, with measurable and time-bound targets.[h]
- **Embed nutrition commitments into a clear and cohesive nutrition strategy** that aligns with the companies' core business objectives.
- **Establish governance structures**—supported by clearly assigned responsibilities and accountability mechanisms—to deliver nutrition-related outcomes effectively and publish key details of these arrangements.

3 Disclose

- **Publicly report annually** on the implementation of their nutrition strategy against defined metrics to promote transparency, recognition, and accountability.

[h] Examples of specific, measurable, and time-bound nutrition commitments—particularly for companies in the premix supply chain—are available in the Commitment Guide for the Paris Nutrition for Growth Summit.[79]

CATEGORY

ENGAGEMENT

WITH CUSTOMERS AND DISTRIBUTORS

CATEGORY CONTEXT

With their financial and technical resources, fortificant producers are well positioned to play a pivotal role in reducing micronutrient deficiencies by contributing to industry-wide efforts to enhance fortification outcomes and support public health across the food value chain. This category assesses how fortificant producers engage with their customers to develop high-quality micronutrients and premix blends that meet the nutritional and functional requirements of fortified foods. It also assesses the support provided to ensure correct usage of these products, enabling adequate and effective fortification of the end product. In addition, it examines the measures taken by fortificant producers to ensure proper handling and storage throughout the supply chain, safeguarding product quality.

BOX 4

ENSURING QUALITY AND EFFECTIVE USE OF FORTIFICANTS: GUIDANCE FROM THE PAHO CODE OF PRACTICE

The PAHO Code of Practice for Food Premix Operations (2005) provides guidelines to ensure the quality, safety, and efficacy of vitamin and mineral premixes used in food fortification.[45] It outlines best practices for the manufacturing, handling, packaging, labelling, storage, and distribution of premixes.

To formulate fortificants effectively, manufacturers must understand the characteristics of the food vehicle—such as its composition, processing conditions, packaging, shelf life, and target market, including whether it has been identified by national food or public health authorities as suitable for fortification. These factors influence nutrient stability, potential losses during production, and compliance with local dietary and labelling regulations. Fortificant producers should therefore request this information from their customers.

Equally important is guiding food producers on the correct usage of fortificants. Accurate dosing is critical: under-dosing may result in nutrient deficiencies or regulatory non-compliance, while over-dosing can pose health risks. Premix manufacturers should therefore provide clear instructions on the target addition rate (e.g. grams of premix per metric ton of food) and blending rate to ensure uniform distribution and effective fortification. Guidance should also be extended to distributors on the proper handling and storage of fortificants to prevent quality degradation during transport and storage.

MAIN FINDINGS

FIGURE 7
CATEGORY PERFORMANCE AND LEVEL OF DISCLOSURE (BY COMPANY)

Technical Support to Customers

Seven companies—BASF, dsm–firmenich, Glanbia, Hexagon, Mirpain Supplevit, SternVitamin/ Mühlenchemie, and Zhejiang NHU—were found to provide technical assistance to customers during the fortification process. However, none demonstrated a structured framework with measurable objectives to guide this support.

Of these, five companies—BASF, dsm-firmenich, Glanbia, Hexagon, and SternVitamin/Mühlenchemie—publicly disclosed their support offerings, while Mirpain Supplevit and Zhejiang NHU shared details with ATNi.[i]

Examples of the technical assistance provided by these companies include:

- **Customized Premix Development:** Tailoring micronutrient blends to customer needs (dsm-firmenich, Glanbia, Hexagon, Mirpain Supplevit, and SternVitamin/Mühlenchemie).[80,81,82]
- **Product Trials and Testing:** Offering sample-based trials and formulation adjustments based on customer feedback (Glanbia, Hexagon, and SternVitamin/Mühlenchemie).[62,80,82]
- **Training and Capacity Building:** Providing global, regional or local training programmes, especially for small- and medium-sized producers (BASF, Hexagon, and Mirpain Supplevit).[62,81,83]
- **Quality Control Support:** Supplying tools and services for testing concentration, homogeneity, and other parameters (Hexagon, SternVitamin/ Mühlenchemie, and Zhejiang NHU).[84,j]
- **Innovation Focus:** Glanbia and dsm-firmenich emphasize research- and development-driven support, improving bioavailability, stability, and shelf life.[82,85]

[i] Hexagon published this information during the course of the VitaMin assessment. Additional examples of customer support that are not publicly disclosed, concerning quality checks and premix customization, were also shared with ATNi.

[j] Zhejiang NHU likewise shared evidence with ATNi demonstrating specific testing requests made by a customer.

BOX 5

INSIGHTS FROM INDIA ON TECHNICAL SUPPORT NEEDS FOR EFFECTIVE FORTIFICATION

ATNi conducted in-person interviews with a range of stakeholders active in India's food fortification value chain—including fortificant producers, F&B companies, development partners, and research institutes. All stakeholders highlighted that while the quality of fortificants is important, it must be complemented by robust technical support to ensure proper application and effective food fortification.

Development partners and research institutes noted that ineffective fortification often results not only from issues with fortificant quality, but also from how fortificants are handled and applied during the fortification process. They emphasized the importance of training fortificant producers, distributors, and users on proper storage and handling practices to prevent degradation of quality and loss of potency. Additionally, food producers require guidance on how to correctly blend fortificants to ensure uniform distribution throughout the end-product.

Several fortificant suppliers in India reported offering technical support to their customers, typically in response to specific requests. For instance, food producers new to fortification often seek advice on optimal storage conditions, particularly regarding temperature and moisture. Some fortificant suppliers also provide equipment-related guidance, especially to smaller companies. One supplier even offers its laboratory facilities for customer testing and training on analytical techniques.

When engaging with customers to develop suitable micronutrient or premix formulations, companies vary in the amount of information they request, with dsm-firmenich demonstrating the most comprehensive approach (see Table 6).

Evidence of customer engagement varied across the companies:

- dsm–firmenich, Hexagon, and Zhejiang NHU shared with ATNi examples of questionnaires, brochures, and e-mails used to engage with their customers.
- Glanbia emphasizes customer collaboration on its website, highlighting key considerations in premix formulation.
- Mirpain Supplevit described its process but did not submit evidence.
- Sudeep claimed to offer support but provided no details or evidence.
- BASF stated that limited information is requested from customers on staple foods, citing consistent composition of these foods and adherence to government labelling and fortification requirements.
- AQC, Piramal, and Zhejiang Medicine did not disclose any relevant information.

TABLE 6

INFORMATION REQUESTED BY FORTIFICANT PRODUCERS FROM THEIR CUSTOMERS TO ENSURE THE MOST SUITABLE FORTIFICANT FORMULATION

	Type of Information Requested					
Company	**Desired form and levels of micronutrients in fortified product**	**Fortified product composition**	**Fortified product processing conditions**	**Fortified product packaging and labelling**	**Fortified product shelf life**	**Intended market of fortified product**
dsm-firmenich	✓	✓	✓	✓	✓	✓
Glanbia	✓	✓	✓		✓	✓
Hexagon	✓		✓	✓	✓	✓
Mirpain Supplevit		✓	✓	✓	✓	
Zhejiang NHU	✓	✓	✓		✓	
Remaining Six companies	No details found in the public domain or shared by the companies					

BOX 6

CUSTOMER ENGAGEMENT IN PRACTICE: EXAMPLES FROM INDIA

Two fortificant producers interviewed in India—PD Navkar and Fermenta—emphasized the importance of engaging closely with their customers to tailor premix formulations effectively. They noted that understanding the type of food being fortified, the production process (particularly temperature conditions), and the target market is essential. This information helps them design premix blends with the appropriate types and levels of micronutrients, taking into account dietary requirements of different populations, as well as potential nutrient losses during processing and transportation.

A food producer interviewed also noted that the packaging of the fortified product—whether in cartons or pouches—can influence processing conditions and the stability of fortificants and should therefore be factored into premix formulation. The producer also emphasized the need to consider consumer acceptability of the fortified end-product, noting that fortificants can influence its sensory qualities.

Instructions to Customers and Distributors on Proper Handling and Use of Fortificants

Four companies—BASF, dsm-firmenich, Hexagon, and Zhejiang NHU—were found to provide instructions to **customers** on the appropriate handling, storage and use of the supplied fortificants. Evidence of guidance documents, instruction manuals, and product labels were shared by dsm-firmenich, Hexagon, and Zhejiang NHU, including specifications on target addition rates. Mirpain Supplevit and Sudeep stated that such instructions are printed on their product labels; however, no supporting evidence was provided. BASF makes Safety Data Sheets—which include information on the handling and storage of its human nutrition products—publicly available on its website.[75] Glanbia reports key considerations when using ingredients to fortify foods, including addition of ingredients in precise quantities, a suitable form, and at the right stage of the production process.[82] However, it is unclear whether the company provides specific instructions to customers on the appropriate handling and use of the supplied fortificants in fortification processes. No relevant information was found or shared by the remaining four companies regarding technical support provided to customers.

Regarding **distributors**, dsm-firmenich and Zhejiang NHU provided evidence of extending handling and storage instructions across multiple geographies. Hexagon shared product labels with relevant guidance for distributors and handlers, while Sudeep shared an example of handling procedures, though it was unclear whether these guidelines are intended for distributors. BASF confirmed that its Safety Data Sheets also apply to distributors.[75] Mirpain Supplevit indicated that it conducts regular facility checks before supplying the fortificants to distributors, but did not provide supporting evidence to support this claim.

None of the companies explicitly referenced fortificant handling and storage instructions in formal distributor agreements. In addition, none of the instructions referenced recognized guidelines on the appropriate handling and use of fortificants—such as the PAHO Code of Practice for Food Premix Operations and the WHO/FAO Guidelines on Food Fortification with Micronutrients.[27,45]

KEY RECOMMENDATIONS FOR FORTIFICANT PRODUCERS

To support effective food fortification, fortificant producers are encouraged to:

1 Evaluate

- **Assess specific customer needs for technical support related to fortification**, and for guiding the development of fortificants that meet customer specifications, national fortification regulations, and dietary requirements.

- **Review the alignment of support and instructions provided to customers and distributors**—on the appropriate formulation, handling and use of fortificants—with national, regional, or globally recognized guidance (e.g. the PAHO Code of Practice for Food Premix Operations and the WHO/FAO Guidelines on Food Fortification with Micronutrients), and identify key recommendations that are not currently covered.

2 Transform

- **Develop a clear, measurable plan** to guide technical assistance (e.g. training, testing services) aligned with company objectives.

- **Provide clear, consistent, and comprehensive instructions** to customers and distributors on the appropriate handling, storage, and use of fortificants—aligned with national, regional, or globally recognized guidance.

- **Use formal agreements** when outsourcing distribution to ensure accountability and prevent product mishandling that could compromise the fortificant quality.

3 Disclose

- **Publicly report on the outcomes of fortification support** (e.g. percentage of customers supported, proportion of adequately fortified products) to enhance transparency and accountability.

CATEGORY

NUTRITION SENSITIVE ACTIVITIES

CATEGORY CONTEXT

The fortification industry faces persistent challenges that limit scale and impact, including high costs—particularly for premix—fragmented policies, and weak enforcement of standards.[36] Small mills, which often serve vulnerable populations, are especially difficult to reach and support, yet they represent a significant share of the market.[10] Limited access to affordable testing infrastructure and unstable input costs further constrain fortification efforts, while weak enforcement creates an uneven playing field for compliant producers.[36]

Larger fortificant producers are uniquely positioned near the start of the fortification value chain and have a distinct opportunity to drive improved fortification outcomes through responsible business practices. Driven by environmental, social and governmental (ESG) commitments—in support of economic, environmental and social progress—market growth opportunities, and risk mitigation, industry leaders can strengthen national fortification efforts by enabling smaller millers and promoting compliant fortification practices (see Box 7).[10,36] Effective support should be guided by clear, structured implementation plans with key performance indicators (KPIs) aligned to company objectives and public health outcomes. Public reporting on the outcomes of such efforts enhances transparency, accountability, and recognition. Scaling impact requires coordinated collaboration across the value chain—leveraging diverse skills and capabilities, aligning with public health objectives, and ensuring that fortification efforts are both effective and sustainable.

This category assesses fortificant producers' broader efforts to support fortification beyond their core commercial activities, highlighting examples of contributions made through shared-value partnerships with governments and development partners.[k,l]

BOX 7
INDUSTRY LEADERSHIP IN ACTION: THE M4N COALITION

A notable example of industry leadership in the fortification space is M4N, a private-sector led coalition of food fortification stakeholders supporting millers in eight countries across Africa and Asia to improve staple food fortification.[86,m] Support may include on-site training in quality assurance, as well as the provision of testing kits and dosing equipment for smaller-scale millers—with the purpose of raising standards in food fortification.

Five of the 11 companies included in the VitaMin assessment are M4N partners: BASF, dsm-firmenich, Hexagon, Piramal, and SternVitamin/Mühlenchemie.[87,n]

k The assessment does not cover activities affiliated with companies' philanthropic foundations.

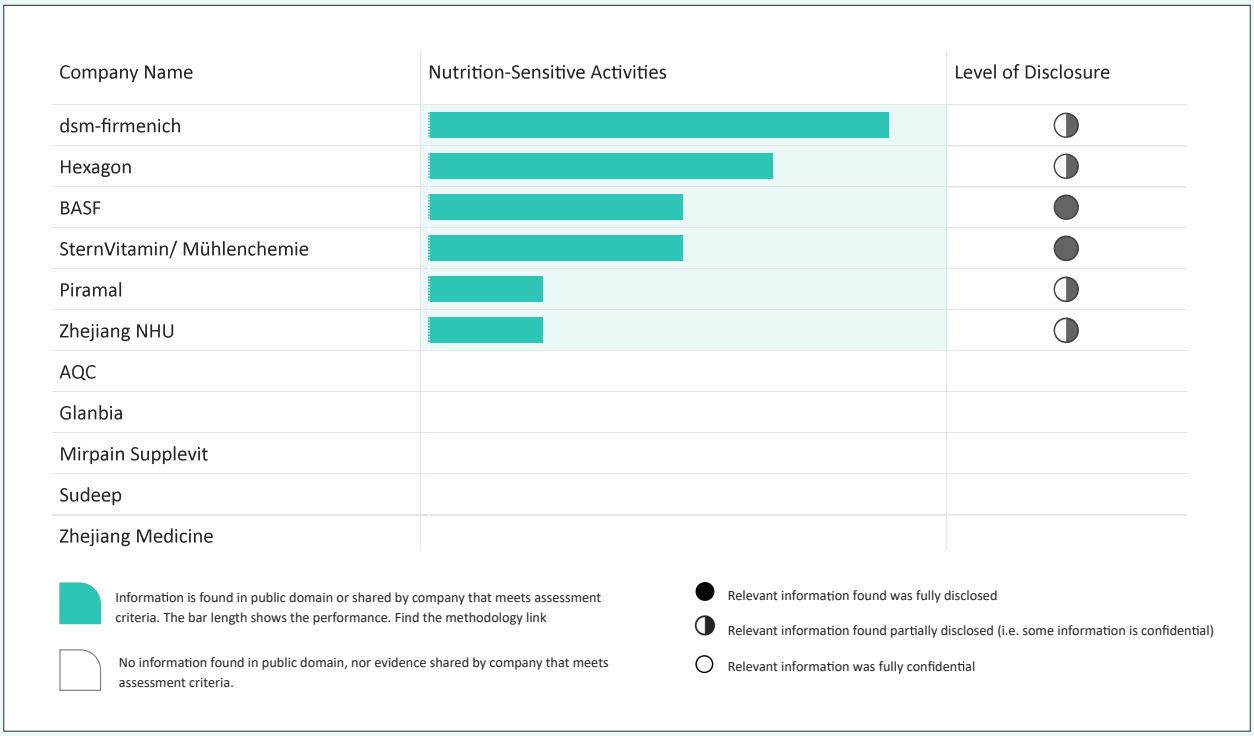
l According to UNICEF, shared-value partnerships generate both societal and business benefits—such as mobilizing resources to combat hidden hunger, while enhancing market access, brand reputation, and strategic communication.

m M4N is active in Bangladesh, Ethiopia, India, Indonesia, Kenya, Nigeria, Pakistan and Tanzania.

n BASF, dsm-firmenich and SternVitamin/Mühlenchemie are global strategic M4N partners, while Hexagon and Piramal operate regionally in South Asia.

MAIN FINDINGS

FIGURE 8
CATEGORY PERFORMANCE AND LEVEL OF DISCLOSURE (BY COMPANY)



Of the 11 fortificant producers assessed, only five–BASF, dsm-firmenich, Hexagon, Piramal, and SternVitamin/Mühlenchemie–were found to provide direct technical assistance to millers, beyond core business operations i.e. not targeted at customers (see Table 7).

Among these, dsm-firmenich and Hexagon demonstrated structured support, with dsm-firmenich also linking its efforts to measurable targets through M4N. For the other three companies, the nature and extent of technical assistance remain unclear due to limited publicly available information or company disclosure.

Five companies–BASF, dsm-firmenich, Hexagon, SternVitamin/Mühlenchemie, and Zhejiang NHU–were also found to support broader fortification efforts beyond direct technical assistance. These include activities such as supporting the development of testing laboratories and helping smaller producers through financial donations and provision of equipment (company examples are provided in Table 7).

TABLE 7

COMPANY EXAMPLES OF RESPONSIBLE BUSINESS SUPPORTING BROADER FORTIFICATION INITIATIVES

	Forms of fortification support through shared-value partnerships				
Company	**Technical assistance to millers°**	**Is technical assistance structured?**	**Is technical assistance linked to measurable targets?**	**Support fortification compliance**	**Targeted interventions for populations at higher risk of malnutrition**
BASF	Works with partners to host public- and private-sector training to build the capacity of small- and medium-scale millers in staple food fortification.[83]	Unknown	Unknown	Opened a micronutrient testing laboratory in Nigeria to support regulators in advancing the country's fortification agenda, and to ensure that fortified edible oils, flour and sugar by smaller-scale producers comply with Vitamin A requirements.[83]	Unknown
dsm-firmenich	Shared examples of its collaboration with M4N, TechnoServe, and UN World Food Programme (WFP) to advance fortification through workshops addressing technical challenges faced by millers across multiple regions.	Yes, including M4N activities	Yes, including M4N activities	* As part of efforts to support the standardization of fortified rice packaging and labelling standards in Nigeria, partnered with WFP, Partners in Food Solutions, and Technoserve to convene a two-day technical workshop—through its M4N Initiative—for rice processors, focusing on compliant packaging design and labelling.[88] * Shared evidence of supporting efforts to standardize fortificant testing procedures.	* At the 2025 N4G Summit in Paris, reconfirmed and updated its commitment to fill the nutrient gap of 1 billion people by 2030 through fortified staples and public health supplements.[89] In efforts to achieve this goal, the company—in partnership with WFP—for example, reaches over 20 million people who benefit from fortified rice through social protection programs annually across the world.[90] In 2024, renewed its WFP partnership for 2025–2027, focusing on scaling access to fortified staples for vulnerable populations through institutional and humanitarian programmes.[91] * Shared evidence of supporting measures to ensure the affordability of fortificants.

Table 7 continues on the next page.

° Beyond core business operations i.e. not targeted at customers.

TABLE 7 (CONT.)

COMPANY EXAMPLES OF RESPONSIBLE BUSINESS SUPPORTING BROADER FORTIFICATION INITIATIVES

	Forms of fortification support through shared-value partnerships				
Company	**Technical assistance to millers[o]**	**Is technical assistance structured?**	**Is technical assistance linked to measurable targets?**	**Support fortification compliance**	**Targeted interventions for populations at higher risk of malnutrition**
Hexagon	* Described its role in M4N as providing technical assistance, sharing knowledge, supplying premix, and monitoring activity progress. * Shared evidence of a formal partnership with the National Institute of Food Technology and Entrepreneurship Management (NIFTEM) in India, which includes joint workshops and hands-on trainings for smaller-scale industries to build fortification capacity.	Yes	Unknown	* Through its partnership with NIFTEM, an institute under India's Ministry of Food Processing Industries, Hexagon provides financial support to establish model fortification plants used for training NIFTEM staff.[92]	Unknown
Mirpain Supplevit	Informed ATNi that it collaborates with stakeholders across the value chain—including government, millers, and humanitarian organizations—to support food fortification but did not provide details of these activities.				
Piramal	Serves as a regional strategic fortification partner of M4N, providing technical support to millers and co-funding the initiative.[93]	Unknown	Unknown	Unknown	Unknown
SternVitamin/ Mühlenchemie	* States in a brochure that its key role in M4N is to support millers worldwide to produce stable and high-quality fortified flour.[94] * Notes on its website that it supports global fortification practices not only through its commercial operations—by supplying micronutrient premixes and dosing systems—but also by offering technical advice and partnering with non-governmental organizations.[95]	Unknown	Unknown	* Collaborates with WHO, GAIN and the Food Fortification Initiative to support government-led flour fortification programmes in various countries through education and consultancy.[96]	* Mühlenchemie developed a micronutrient mix tailored to the needs of small millers in East Africa who require smaller packages of premix.[p] * Mühlenchemie donations enabled the installation of 29 Sanku dosifiers in small mills in Tanzania.[97,q]

Table 7 continues on the next page.

[p] Mühlenchemie works closely with its sister company SternVitamin, which specializes in micronutrients for all kinds of food applications.

[q] Sanku is a social enterprise dedicated to combating micronutrient malnutrition by enabling small and medium-scale flour millers in East Africa to produce affordable fortified flour.

TABLE 7 (CONT.)

COMPANY EXAMPLES OF RESPONSIBLE BUSINESS SUPPORTING BROADER FORTIFICATION INITIATIVES

	Forms of fortification support through shared-value partnerships				
Company	**Technical assistance to millers**[o]	**Is technical assistance structured?**	**Is technical assistance linked to measurable targets?**	**Support fortification compliance**	**Targeted interventions for populations at higher risk of malnutrition**
Sudeep[r]	Informed ATNi that it collaborated with the Food Safety and Standards Authority of India to provide trainings for millers interested in rice fortification; however, no evidence was provided to substantiate this statement.	Unknown	Unknown	Reported offering rice fortification premixes at subsidized rates to government bodies and private organizations but did not provide supporting evidence.	
Zhejiang NHU	Unknown	Unknown	Unknown	In 2023, held a seminar in collaboration with the Indonesian government focused on regulatory developments in vitamin A fortification of palm oil and technological innovations to support implementation.[98]	Unknown
AQC, Glanbia, and Zhejiang Medicine	No details were found in the public domain or shared by the companies regarding broader fortification initiatives.				

[r] Sudeep is part of the M4N coalition as a miller company instead of a regional or strategic partner.

KEY RECOMMENDATIONS FOR FORTIFICANT PRODUCERS

To advance meaningful global fortification efforts and scale impact, fortificant producers are encouraged to:

1 Evaluate

- **Assess which stakeholders (e.g. governments, development partners) to collaborate with**, and identify priority projects—such as technical assistance, supporting fortification compliance, or targeted interventions for at-risk populations—to maximize the impact of sector-wide fortification efforts.

2 Transform

- **Jointly develop a clear, measurable plan** to guide this support, aligning with both public health goals and company objectives.

3 Disclose

- **Publicly disclose the outcomes of these efforts** (e.g. percentage of beneficiaries reached or proportion of adequately fortified products) to enhance transparency, accountability, and recognition of shared impact.

CATEGORY

WORKFORCE NUTRITION

CATEGORY CONTEXT

Workplace settings—where most people spend one-third of their adult lives and consume at least one daily meal—are recognized by WHO as a promising platform for implementing nutrition interventions at scale. These are considered contained environments that can be modified with relative ease and that involve consistent interaction with a substantial and recurrent audience.[99]

The business case for investing in workforce nutrition programmes is clear: benefits include improved employee health and well-being, increased productivity, reduced absenteeism, and higher employee morale, engagement, and retention. In addition, such programmes can help foster a company culture with a stronger focus on nutrition in business practices. Studies have estimated the financial return on investment in workforce nutrition programmes for businesses to be as high as 6:1.[99-101] The Workforce Nutrition Alliance (WNA) has identified four main types, or "pillars", of effective workforce nutrition interventions for employees.[s]

1) Healthy food at work: Focusing on increasing access to healthy food in the workplace—either through direct provision, subsidies, or greater availability—can raise nutritional awareness and promote healthier behaviours.[102]

2) Nutrition education programmes: These programmes aim to change employees' nutrition and lifestyle behaviours by increasing their knowledge of healthy diets.[103]

3) Nutrition-focused health checks: These offer employees nutrition-related health assessments coupled with counselling, which can help prevent NCDs such as diabetes and heart disease.[104,105]

4) Breastfeeding support (including parental leave): WHO and the United Nations Children's Fund (UNICEF) recommend that children be exclusively breastfed for the first six months of life, followed by complementary foods with continued breastfeeding up to two years of age or beyond.[106] Company programmes and policies—such as paid caregiver leave and workplace facilities—can enable working mothers to breastfeed exclusively for six months and continue for up to two years, benefiting the health of both mothers and their infants.[107]

Some key elements of breastfeeding support in the workplace include paid breastfeeding breaks during working hours, flexible working time and location, and access to a private, hygienic, and comfortable dedicated space with clean storage facilities for breastmilk, handwashing facilities, and necessary supplies such as drinking water, hand sanitizer, and paper towels.[107,108]

Since longer maternity leave is associated with extended breastfeeding, it is crucial that employers provide paid maternity leave in line with WHO recommendations of at least 26 weeks or more.[t] Paternity leave also indirectly supports longer breastfeeding and reduces the likelihood of mothers' post-partum depression, thereby benefitting infant health.[109]

This category assesses the extent to which fortificant producers provide these measures for their employees globally, going beyond minimum legal requirements.

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[s] The WNA is a partnership between GAIN and the Consumer Goods Forum, established in 2019 to drive momentum on workforce nutrition and support organizations in assessing, enhancing, and executing their workforce nutrition programmes.

[t] According to the International Labour Organization (ILO) Maternity Protection Convention, 2000 (No. 183), the minimum standard is 14 weeks of paid maternity leave. An ILO recommendation adopted in 2000 extends this to 18 weeks, while WHO recommends 26 weeks.

MAIN FINDINGS

FIGURE 9
CATEGORY PERFORMANCE AND LEVEL OF DISCLOSURE (BY COMPANY)

Company Name	Workforce Nutrition	Level of Disclosure
dsm-firmenich		◑
BASF		●
Hexagon		◑
Glanbia		●
SternVitamin/ Mühlenchemie		●
AQC		
Mirpain Supplevit		
Piramal		
Sudeep		
Zhejiang Medicine		
Zhejiang NHU		

Information is found in public domain or shared by company that meets assessment criteria. The bar length shows the performance. Find the methodology link

No information found in public domain, nor evidence shared by company that meets assessment criteria.

● Relevant information found was fully disclosed

◑ Relevant information found partially disclosed (i.e. some information is confidential)

○ Relevant information was fully confidential

Among the 11 companies assessed, four publicly disclose having a nutrition-focused programme in place for their employees, aligned with at least one of the workforce nutrition pillars. Hexagon, while not publicly disclosing, shared evidence with ATNi of addressing selected pillars.

None of the companies were found to offer a comprehensive workforce nutrition programme or policy covering all four workforce nutrition pillars. Furthermore, most do not disclose whether workforce nutrition benefits are offered consistently across all markets and to all employees–including both office and factory workers. An overview of the measures in place for all companies assessed, including details on geographic scope and availability to employees, is provided in Table 8.

TABLE 8

SUMMARY OF WORKFORCE NUTRITION INTERVENTIONS OFFERED BY THE COMPANIES ASSESSED

Company	Healthy Food at Work	Nutrition Education	Nutrition Focused Health Checks	Breastfeeding Support Including Parental Leave
AQC				
BASF			🌐 ?	📍 👤
dsm-firmenich		🌐 👤		🌐 👤
Glanbia		🌐 👤		
Hexagon		📍 ?	📍 👤	
Mirpain Supplevit				
Piramal				
SternVitamin/ Mühlenchemie	# ?			
Sudeep				
Zhejiang Medicine				
Zhejiang NHU				

Legend:

- 🌐 Global measures offered
- 📍 Single market measures offered
- # Measures offered but market scope is unknown
- 👤 Measures offered to all employees
- ? Measures offered to some employees but unknown if available to all, e.g. office and manufacturing workers
- Empty cells indicate that either no measures are currently in place or it is unknown whether any measures are offered

Healthy Food at Work

SternVitamin/Mühlenchemie notes on its website that, as part of preventive health care, it provides employees with well-stocked fruit baskets.[110] In its 2024 annual report, dsm-firmenich states that it organized a global webinar for employees on the importance of protein and expanded the availability of its nutritional supplements in company restaurants.[91]

For both companies, it is unclear whether these efforts are part of a systematic programme to provide healthy food for all employees across all markets. For the remaining nine companies, no information or evidence was found regarding the provision of healthy food at work.

Nutrition Education

dsm-firmenich and Glanbia publicly report on their employee-focused nutrition education initiatives. dsm-firmenich's BoostYourVitality platform, available in six languages, offers science-based lifestyle and nutrition guidance along with discounted food supplements.[91] However, it is unclear how the company ensures that supplements sold through the platform or available in company canteens are used only in line with recommendations from health authorities.

Glanbia's 2024 Sustainability Report, highlights global and local employee well-being initiatives, including nutrition education and physical exercise classes.[63] In addition, its website features the Sports Nutrition School, an educational programme available to Glanbia employees, as well as customers, retailers and distributors, though it is unclear whether this is offered free of charge.[111]

Hexagon shared details of its 31-Day Nutrition Challenge, launched in India in March 2025, which aims to promote healthier daily habits through improved nutrition and physical activity. Among the remaining companies, BASF mentions a Global Health Promotion Program with annual prevention campaigns; however it is unclear whether this explicitly includes nutrition.[12] Mirpain Supplevit expressed a commitment to nutrition education for employees—including healthy eating habits, obtaining vitamins and minerals from natural food sources, and the importance of addressing malnutrition—but did not provide supporting evidence.

Nutrition-focused Health Checks

As part of its Global Health Promotion Program, BASF reports offering regular individual health checks for employees globally, including pre-diabetes assessments.[112,113] Hexagon shared evidence of annual health check-ups for employees covering blood sugar, cholesterol, and triglycerides. The company clarified that consultations with nutritionists and dieticians are also included, though evidence was not provided to substantiate this claim.

dsm-firmenich indicated that health checks were offered in a few countries under its BoostYourVitality programme. However, the initiative faced challenges due to employee concerns about data privacy, which limited its uptake.

Breastfeeding Support in the Workplace

Five companies report offering arrangements to support breastfeeding in the workplace. dsm-firmenich shared examples of initiatives focused on women's health, including dedicated breastfeeding rooms with refrigerators for breastmilk storage and flexible hybrid work options. BASF discloses it offers free breastmilk shipping in the U.S. for employees who are relocating, travelling for business, or involved in a surrogacy arrangement—complete with specialized packaging and overnight delivery.[114]

Hexagon and Sudeep informed ATNi that they provide multipurpose rooms for breastfeeding or rest at their sites in India, supported by photos. However, they did not confirm whether these spaces meet recommended standards—including India's Maternity Benefit Act, UNICEF guidelines, or WNA recommendations—or whether they are accessible to all employees. Hexagon further explained that it offers a public kindergarten facility which allows mothers to breastfeed during breaks, as mandated by local regulations.

Mirpain Suppplevit and Piramal mention offering flexible work arrangements for returning mothers, though no additional breastfeeding support was confirmed.[115]

Paid Maternity and Secondary Caregiver Leave

Out of the 11 companies assessed, two were found to provide maternity and paternity leave arrangements to their employees.

BASF has established a group-wide standard of at least 14 weeks of maternity leave, with a minimum of six weeks post-delivery.[116] In the U.S., where no federal paid leave is mandated, BASF offers eight weeks of paid parental leave to maternal, paternal, or adoptive parents, in addition to six to eight weeks of paid maternity leave available for new mothers—an example of the company exceeding local requirements.[117]

dsm-firmenich is the only company found to offer maternity leave extending beyond national regulations in multiple markets where it operates. The company shared its current Parental Leave Guidelines, explaining that a new harmonized policy is under development following the merging of dsm and Firmenich. The policy includes 16 paid weeks of paid leave for primary caregiver and two weeks for secondary caregivers. This surpasses local laws in some countries where the company operates—for example, Switzerland and Mexico for maternity leave, and Malaysia and the U.S. for both maternity and paternity leave.

For the remaining companies, no relevant information was found in the public domain regarding parental leave. In addition, for most companies it remains unclear whether parental leave benefits apply to all employees or are limited to office-based staff.

KEY RECOMMENDATIONS FOR FORTIFICANT PRODUCERS

To fully leverage the potential of workforce nutrition, companies are recommended to:

1 Evaluate

- **Assess existing activities under each workforce nutrition pillar**—including the length of paid maternity and secondary caregiver leave, and measures to support breastfeeding mothers—in each market where they operate, using the WNA self-assessment scorecards.

2 Transform

- **Develop workforce nutrition programmes** that provide access to healthy food at work, nutrition education, nutrition-related health checks, and breastfeeding support. These programmes should be made available to all employees, including those at manufacturing sites.

- **Establish measurable targets and KPIs** to track and drive progress across each of the four pillars. Ideally, these programmes should be part of company policy and implemented across all markets in which the company operates.

- **Develop comprehensive global parental policies**, offering 26 weeks of paid maternity leave as recommended by WHO across all markets and for all employees. Companies are also encouraged to extend secondary caregiver leave to exceed current national regulations.

3 Disclose

- **Report annually on progress** in implementing workforce nutrition programmes in each market where the company operates.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The purpose of the VitaMin Assessment is to understand the current nutrition- and fortification-related practices of fortificant producers and provide actionable recommendations to strengthen their accountability and transparency.

The global Corporate Profile assessment of 11 of the world's largest micronutrient and premix producers—complemented by country case studies in India and Kenya—underscores the pivotal role fortificant producers play in advancing food fortification for improved nutrition outcomes. Their influence extends beyond supplying quality micronutrients to shaping practices and partnerships across the value chain.

While the VitaMin Assessment identifies several examples of fortificant companies' nutrition-related efforts; these are largely incidental, with unclear implementation mechanisms and limited, less structured disclosure in the B2B sector. As a result of this assessment, ATNi has seen improved transparency from Hexagon on its website, demonstrating that greater transparency is both achievable and meaningful. The company's improved disclosure underscores the value of the assessment framework in guiding companies toward more structured and accountable nutrition-related practices, setting a precedent for others in the industry to follow.

While nutrition represents a relatively smaller part of the core business for almost half of the companies assessed, they nonetheless hold significant potential to influence nutrition outcomes with their products and beyond—internally through their workforce, externally through their customers, and more broadly across the value chain. However, **sector-wide alignment is needed to clearly define the role of fortificant producers and to establish explicit expectations and minimum performance requirements**, to harness their contributions in measurable ways that deliver improved nutrition outcomes.

Key findings include:

- **Strategic Nutrition Commitments:** Of the 11 companies, two suppliers, dsm-firmenich and Hexagon have integrated nutrition into their core business strategies with measurable goals. However, implementation mechanisms remain unclear, and their documentation and disclosure can be improved for all companies.

- **Customer Engagement and Technical Support:** Seven of the 11 companies provide some form of technical assistance to customers—such as customization, innovation, capacity building, testing, and instructions on the appropriate handling, storage, and use of the supplied fortificants. However, none demonstrated a structured framework with measurable objectives to guide this support and ensure high quality end-product outcomes.

- **Distributor Practices:** Four companies—BASF, dsm-firmenich, Hexagon, and Zhejiang NHU—extend handling and storage guidelines to distributors, though these are not linked to formal agreements and do not reference recognized guidelines such as the PAHO Code of Practice for Food Premix Operations. Two other companies—Mirpain Supplevit and Sudeep—mentioned related procedures but did not provide supporting evidence.

- **Strategic Partnerships to Support Fortification:** Five companies extend technical assistance to millers beyond their direct customer base, with dsm-firmenich and Hexagon providing structured support. Notably, dsm-firmenich links its assistance to measurable targets, enhancing accountability. These efforts help millers address technical challenges in fortifying and labelling products according to national standards. Broader collaborative fortification efforts—such as supporting the implementation of regulations,

subsidizing premix, or donating equipment—were also identified for five companies (BASF, dsm-firmenich, Hexagon, SternVitamin/Mühlenchemie, and Zhejiang NHU). However, limited disclosure of the planned activities and objectives makes it difficult to assess the implementation and impact of these efforts.

- **Workforce Nutrition:** Five companies—BASF, dsm-firmenich, Glanbia, Hexagon, and SternVitamin/Mühlenchemie—disclosed initiatives aligned with at least one workforce nutrition pillar. BASF and dsm-firmenich were found to offer breastfeeding support in the workplace, including parental leave, beyond legal requirements in some countries. However, no company has a comprehensive workforce nutrition policy covering all four pillars, and most do not disclose whether support is provided consistently to all employees and across all worksite locations.[u]

The country case studies in India and Kenya provide additional insights into the critical role fortificant producers and suppliers play in advancing fortification practices, demonstrating both the practical approaches and potential impact—which can be amplified through collaborations with development partners. Fortificant producers can strengthen the value chain by training distributors and customers on appropriate storage and handling practices, but also by offering testing kits and services, and context-specific solutions like smaller packaging and efficient distribution networks. These solutions are especially important for reaching smaller mills that serve vulnerable populations but face procurement challenges. Food producers also play a key role in driving demand for high-quality ingredients and greater transparency from suppliers. However, to enable consistent and effective fortification practices, governments must ensure a level playing field through implementing evidence-based policies, clear standards, and robust monitoring systems, as well as capacity building. Leveraging these market and policy drivers can further enable and incentivize responsible business conduct and enhance transparency and accountability across the sector. The findings from the country case studies are presented in more detail in a separate report, which can be found here.

[u] The WNA has identified four main pillars of effective workforce nutrition interventions for companies' employees: 1) Healthy food at work; 2) Nutrition education programs; 3) Nutrition-focused health checks; and 4) Breastfeeding support (including parental leave).

RECOMMENDATIONS FOR INDUSTRY

To strengthen their role and impact in the food fortification value chain, fortificant producers are encouraged to demonstrate leadership and accountability by:

1 Safeguarding fortificant quality throughout the value chain

- **Sourcing and producing high-quality micronutrients and premix blends** tailored to customers fortification needs while ensuring compliance with national fortification standards and dietary requirements.
- **Implementing strict handling and storage practices**—whether the company supplies fortificants directly or via third-party distributors—including regular inspections and the provision of clear instructions and compliance standards.
- **Aligning practices with globally recognized guidelines**, such as the PAHO Code of Practice for Food Premix Operations.

2 Facilitating effective fortification through structured commercial operations and strategic partnerships

To advance fortification efforts throughout the value chain, fortificant producers should implement structured support mechanisms that align commercial activities with public health objectives. They are therefore encouraged to:

- **Embed nutrition-related commitments into a clear and cohesive nutrition strategy** that aligns with core business objectives.
- **Establish targeted initiatives with clear goals and robust monitoring frameworks** that reflect both business priorities and nutrition impact. Examples include:
  - Delivering tailored support, such as training and quality control services, to address specific fortification challenges.
  - Launching targeted programs aimed at populations vulnerable to micronutrient deficiencies—for example, offering fortificants at reduced cost in high-need markets or enhancing supply chain efficiency to improve access.

While such activities can be delivered to customers, companies are encouraged to expand their reach through shared-value partnerships with governments and development partners. Such collaborations can amplify impact and foster sustainable progress.

- **Clearly disclose the scope, objectives, and outcomes of their nutrition strategy and fortification-supporting activities**, emphasizing measurable achievements. This enhances transparency and accountability.
- **Engage responsibly with policymakers** to promote the adoption of evidence-based fortification regulations that advance public health.

3 Promoting peer learning and driving innovation in fortification

To accelerate progress across the industry, companies should:

- **Share successful practices and innovative solutions**—within competitive boundaries—through initiatives such as M4N. For example, global premix suppliers are encouraged to provide technical and operational support to emerging smaller, local premix blenders that source their fortificants from them. Such exchanges can help build collective capacity and drive continuous improvement.
- **Demonstrate the tangible benefits of fortification initiatives** to encourage broader adoption and inspire action across the sector.

RECOMMENDATIONS FOR POLICYMAKERS

To ensure fortification efforts deliver meaningful and sustained public health impact, a supportive policy environment is essential—to support and encourage all industry actors, especially smaller, local fortificant producers and millers, to engage in effective fortification practices.

Drawing on the Organisation for Economic Co-operation and Development's (OECD's) core pillars to improve regulatory governance of food fortification, governments, policymakers, and public health standard-setting bodies are encouraged to:[113]

1 Harmonize micronutrient and premix standards, testing, and fortification practices

- Convene and support **coordination among national, regional, and global stakeholders** to foster collaboration and alignment on LSFF efforts.
- Develop (and update, as needed) **clear, evidence-based, and context-specific standards on micronutrient, premix, and fortification**—covering formulation, processes, testing, and labelling—ensuring they are both comprehensive and prescriptive.
- Systematically gather and integrate **feedback from a diverse range of stakeholders** early and throughout all stages of policy development.
- **Enforce compliance with mandatory national fortification-related standards** and incentivize compliance with voluntary standards.
- **Provide clear guidance documents and technical training to build fortification capacity** and support industry compliance with regulatory fortification requirements.
- **Establish clear criteria to determine which F&B products are eligible or ineligible for market-driven fortification**, based on nutritional value and public health priorities in each context.
- **Foster a level-playing field** to encourage industry-wide compliance.

2 Strengthen monitoring and enforcement mechanisms

- **Integrate monitoring of fortification, micronutrients, and premixes into existing food safety control systems** and clearly **define roles and responsibilities** to enhance regulatory efficiency and effectiveness.
- **Establish secure digital traceability systems** with rapid testing and digital tools to allow automatic monitoring of fortification quality across different supply chains and enable targeted corrective actions where quality issues are identified.
- **Develop registration and licensing systems** (where necessary) for businesses involved in the production, import, and export of fortificants or fortified foods. These systems should be risk-based and evidence-driven to support effective monitoring and promote compliance, ensuring that all requirements and processes are transparent.
- **Ensure comprehensive testing for all mandated micronutrients**, avoiding selective or inconsistent testing practices.
- **Invest in training programmes for inspectors** to build capacity for effective enforcement and regulatory oversight.
- **Mandate company reporting on critical fortification efforts** to facilitate improved transparency, monitoring, and accountability.
- **Monitor the impact of fortification on the population** micronutrient status and health outcomes.

3 Reduce the costs of fortification

- **Remove import taxes and tariffs on fortificants** used for LSFF—particularly in countries where local production is limited—to reduce input costs and improve access. Custom duties in particular tend to be the highest and most variable tax category.[v]
- **Provide subsidies for key fortification-related expenses**—such as equipment, premixes, and testing—to encourage adoption of approved practices.
- **Benchmark fortificant prices** to enhance transparency, identify cost drivers, and ensure fair pricing across markets.
- **Incorporate LSFF into social safety net programmes** and other public distributions systems to promote uptake and strengthen the market for LSFF.

[v] According to an unpublished review conducted by GAIN covering 72 countries across Africa and Asia, import taxes and duties significantly drive up the cost of fortificants—which typically account for 70–90% of total fortification costs—with substantial variation across regions.

- Customs duties ranged from 0% to 30% in Africa and up to 65% in Asia-Pacific, often fluctuating without notice.
- VAT and consumption taxes reached up to 20% in Africa and 16% in Asia, though VAT is often offset.
- Additional levies imposed on imported goods—including regional integration fees, country specific levies, solidarity charges, and statistical fees—are common in Africa and present in Asia, further compounding costs.
- Government clearance charges, while generally low, can exceed 9% of landed costs in some countries in Africa (e.g. Nigeria).

RECOMMENDATIONS FOR INVESTORS

Investors should aim to invest only in responsible fortificant producers—those who not only supply high-quality micronutrients and premixes but also demonstrate leadership in transparency, quality assurance, and public health impact. Investors are encouraged to:

Allocate capital to fortificant producers that:

- **Conduct internal and external audits** of their quality systems and disclose key outcomes.
- **Supply products that comply with local regulatory requirements and national fortification standards.**
- **Apply consistent fortification practices across markets**, aligned with globally recognized fortification guidelines such as the PAHO Code of Practice for Food Premix Operations and WHO/FAO guidelines.
- **Disclose the scope, objectives, and outcomes of fortification-supporting activities** aligned with company objective and public health goals.
- Ensure that quality fortificants are **affordable and accessible in high-need markets.**

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